2003 ANNUAL REPORT

Strategic Habitat Plan Accomplishments

Aquatic Habitat, Terrestrial Habitat, Habitat and Access Maintenance, and Lands Administration Sections

Wyoming Game and Fish Department
April 2004

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Wyoming Game and Fish Department

Mission

Restore and/or manage habitat to enhance and sustain wildlife populations in the future.

Vision

The Wyoming Game and Fish Department is the steward of Wyoming's wildlife, dedicated to the conservation of sustainable, functional ecosystems capable of supporting wildlife populations at least as healthy, abundant and diverse as they were at the dawn of the 21st century. We will take a holistic approach to habitat management, integrating various land uses while involving the general public, private landowners and land management agencies. Our lands will be managed to emphasize and maintain the wildlife habitat and public access values for which they were obtained.

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INTRODUCTION

One of the single greatest challenges facing the Wyoming Game and Fish Department in the 21st century will be our ability to maintain sustainable fish and wildlife populations. This challenge can be met by addressing habitat needs and issues that seek to maintain open spaces, quality habitats and the ability of fish and wildlife to utilize these areas. Many habitat types are imperiled or at-risk. Potential impacts to fish and wildlife habitats are expanding, with some of the most noticeable being energy development, other land uses, and urban sprawl. The long-term drought has caused impacts as well. At the same time, we are being asked to take a far more active role in the conservation of all wildlife species, including many considered to be at-risk. Conserving these species one species at a time is impractical over the long-term. To effectively answer these challenges, there is a great need for the Department to be collaboratively involved in habitat-related decisions at a landscape level on public and private lands throughout Wyoming.

In recognition of this need, the Wyoming Game and Fish Commission adopted a strategic habitat plan in 2001. The plan has three goals as follows:

1. Manage, preserve and restore habitat for long -term sustainable management of wildlife populations.

2. Increase wildlife based recreation through habitat enhancements that increase productivity of wildlife.

3. Increase or maintain wildlife habitat and associated recreation on Commission lands.

Each goal is accompanied by a number of objectives and strategies designed to achieve that goal. These goals and strategies were developed by an inter-divisional, inter-disciplinary team, and were designed for implementation collaboratively across division lines. It is of paramount importance that habitat conservation in Wyoming be extended to the landscape level, working collaboratively across organizational lines within and outside the Department, and across political and legal boundaries on the ground.

Implementation of the plan is underway and is being at least partially addressed as reported below. We are approaching habitat conservation based on the land itself and the needs of all the wildlife and people who depend on it. This requires a great deal of teamwork and a broader view of our responsibilities. Plan implementation represents not a reorganization of the past, but a bold step into the future

The purpose of this 2003 annual report is to provide information and documentation to the Wyoming Game and Fish Commission and other interested parties about the activities of the Terrestrial Habitat, Aquatic Habitat, and the Habitat and Access Maintenance programs of the Department as well as associated portions of the Land Administration program. The report includes actions, activities, and on-the-ground accomplishments of personnel within the four programs toward implementing the strategic habitat plan. One of the additional reporting parameters requested was a compilation of funding sources and expenditures to accomplish the mission and vision of the Strategic Habitat Plan. This was compiled by approximating Department funds from the Trust Fund Account, Walk-In Area Habitat Enhancement Program, maintenance and operation budgets used for habitat development and maintenance less personnel and equipment costs, Farm Bill Program funds that include incentive payments and 10- to 15-year annual rental/lease payments from USDA/NRCS/FSA, funds from other federal or state agencies, funds from non-governmental organizations, and finally funds from private landowners or managers, including in-kind services. In addition, several statewide programs related to the Strategic Habitat Plan are included. These programs involved technical assistance and education for range condition and health relative to livestock and big game grazing and workshops for

private landowners and managers, another program for sagebrush management, riparian management and tall forb communities, development of a GIS decision support system for the Department and an effort related to the conservation of prairie stream systems. This information is summarized on a statewide basis below (Figures are rounded to the nearest $1,000):

Approximate Wyoming Game and Fish Department funds expended for Strategic Habitat Plan Goals 1, 2 and 3 during 2003: **$1,532,000**

Non-Department funds allocated/expended for Strategic Habitat Plan Goals 1 and 2 during 2003:

- Farm Bill Government Funds (USDA/NRCS/FSA): $1,890,000
- Other Federal Government Funding Sources: $ 532,000
- Other State & Local Government Funding Sources: $ 607,000
- Non-Governmental Organizations and Groups: $ 635,000
- Private Landowners Contributions (includes in-kind): $ 362,000

- Non-Department Subtotal for Goals 1 and 2: $4,026,000

Non-Department funds allocated/expended for Strategic Habitat Plan Goal 3 during 2003:

- Other Federal Government Funding Sources: $ 15,000
- Other State & Local Government Funding Sources: $ 10,000
- Non-Governmental Organizations and Groups: $ 26,000
- Private Landowners Contributions (includes in-kind) $ 16,000

- Non-Department Subtotal for Goal 3: $ 67,000

Subtotal Non-Department Funds: $4,093,000

Grand Total for Goals 1, 2 and 3: $5,625,000

We hope this Strategic Habitat Plan report provides the Commission, the general public, interested constituents, landowners, partners, and cooperators with meaningful and useful information relative to habitat projects, activities, and functions locally and on a statewide basis. Without your cooperation, input, communication, and support, wildlife conservation in Wyoming would be impossible. We believe "habitat" and "open spaces" are the keys to maintaining wild and healthy populations of fish and wildlife. We greatly appreciate your assistance and support and look forward to working with you to accomplish even more next year.

Please contact any of the personnel listed for additional information. Also, please feel free to share this report or request additional reports for anyone who may be interested in the Department's habitat efforts.

CASPER REGION

North Natrona Shrub Change Detection Project

The contractor, Digital Environmental Management, Inc. (DEM), has provided the final classification, consisting of 22 different vegetative classes. The big sagebrush classification is broken down into three classes that include sparse crown closure (5-15% cover), moderately dense crown closure (15-25% cover) and dense crown closure (>25% cover). Accuracy standards for each vegetative class were established in the contract. We have initiated accuracy assessments to ascertain "user's accuracy" and "producer's accuracy". The user's accuracy quantifies how well the classification represents what is actually on the ground; whereas the producer's accuracy quantifies how well a particular vegetative class can be mapped. Project completion is scheduled for June 30, 2004. This information will be used to document vegetative changes, specifically big sagebrush, over three decades, which may be responsible for the downward trends documented in pronghorn, mule deer, and sage grouse populations. This information will also provide a basic landscape level wildlife habitat inventory for this herd unit. These GIS databases will enable personnel to devise habitat improvement plans, strategies and programs for large-scale wildlife habitat restoration efforts; provide graphics to demonstrate current habitat conditions; create a baseline inventory for monitoring change in landscape features, such as big sagebrush control, mineral development surface disturbances, and other landscape management practices; and facilitate testing of wildlife habitat models which predict wildlife seasonal preferences and habitat needs. Figures 1-3 are examples of classifications that have not been accuracy assessed; therefore these classifications could be modified prior to project completion.

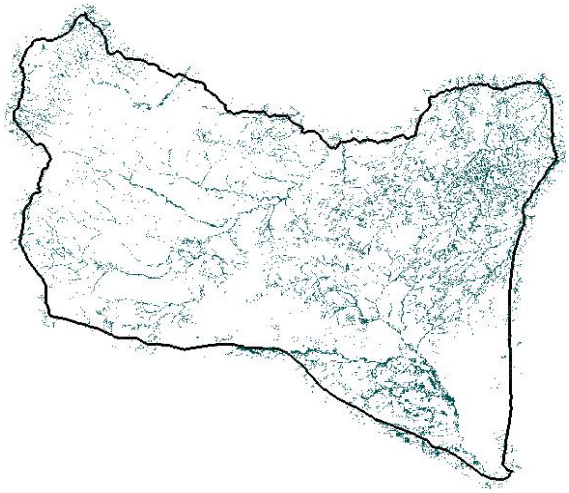


Figure 1. Riparian/moist grass classification.

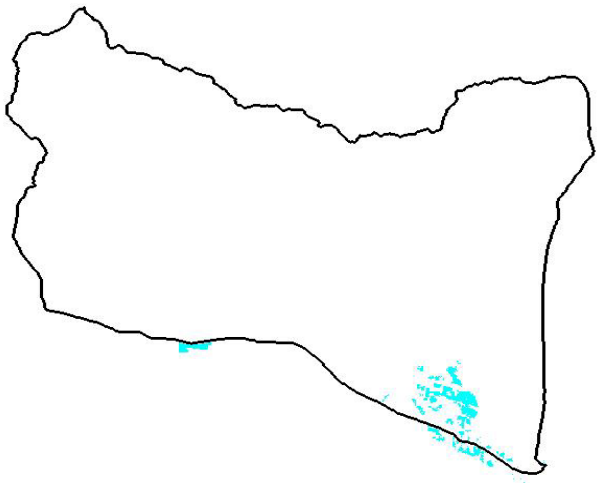


Figure 2. Irrigated cropland classification.

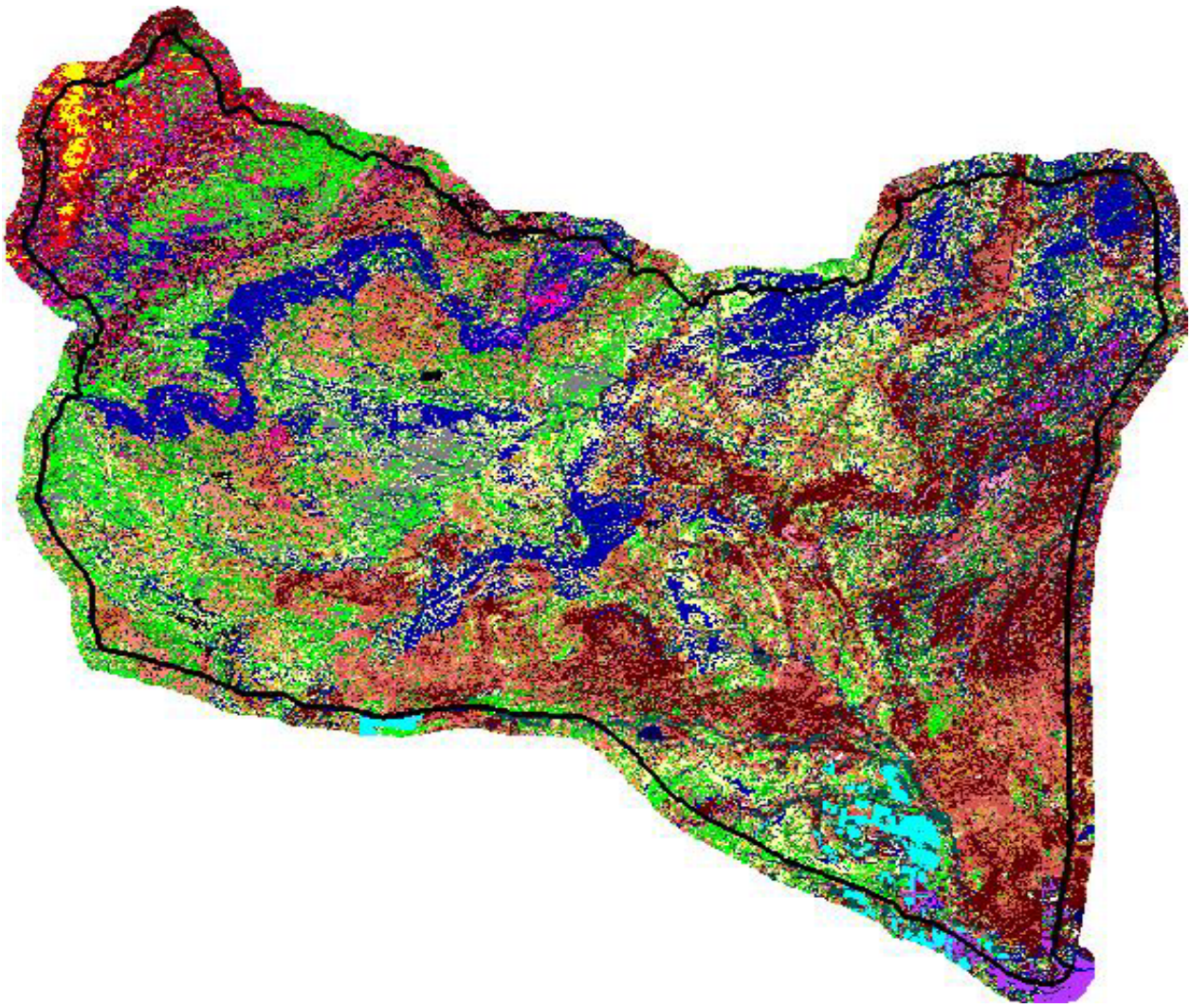


Figure 3. Entire vegetative classification for North Natrona herd unit.

Thunderbasin and Rattlesnake Hills Change Detection Project

We have contracted with Earth Satellite Corporation (EarthSat) to conduct a landcover classification for the Thunderbasin and Rattlesnake Hills mule deer herd units. This area encompasses approximately 3.1 million acres. We have received an initial classification, which we will begin ground-truthing during the 2004 field season. Any discrepancies in the classification will be returned to EarthSat for modifications to that particular classification. Each classification will be accuracy assessed to determine the "user's accuracy" and the "producer's accuracy". As in the North Natrona contract, accuracy assessments have been established for each vegetative class. Project completion is scheduled for June 30, 2005.

This project was initiated because there has been a decline in the extent, distribution and quality of sagebrush steppe communities in central Wyoming over the past 20-40 years. Remaining big sagebrush communities are often in an advanced seral stage with poor understory diversity and cover. During the past 20 years, mule deer, pronghorn and sage grouse populations have declined. Populations following extreme climatic conditions, primarily severe winters and to a lesser extent extended droughts, have not recovered to levels recorded in the 1960's and 1970's, and may be reflective of habitat conditions. It is desirable to have an inventory of current land cover/habitat types, vegetative community condition, seral stages of big sagebrush, and understory productivity and diversity across the area for planning improvement, rehabilitation and management activities. The current land cover will be compared to 1970, 1980 and 1990 coverage to detect changes over time. This information will allow us to analyze the degree of recovery, and time of recovery from past manipulations or management activities in the big

sagebrush steppe. Additional data collection will involve big sagebrush seral stage assessments, and community health and forage quality assessments. Furthermore, the information will provide a valuable planning tool in identifying areas for habitat treatments, rehabilitation of degraded communities, developing mitigation alternatives, and management recommendations on future actions in the area.

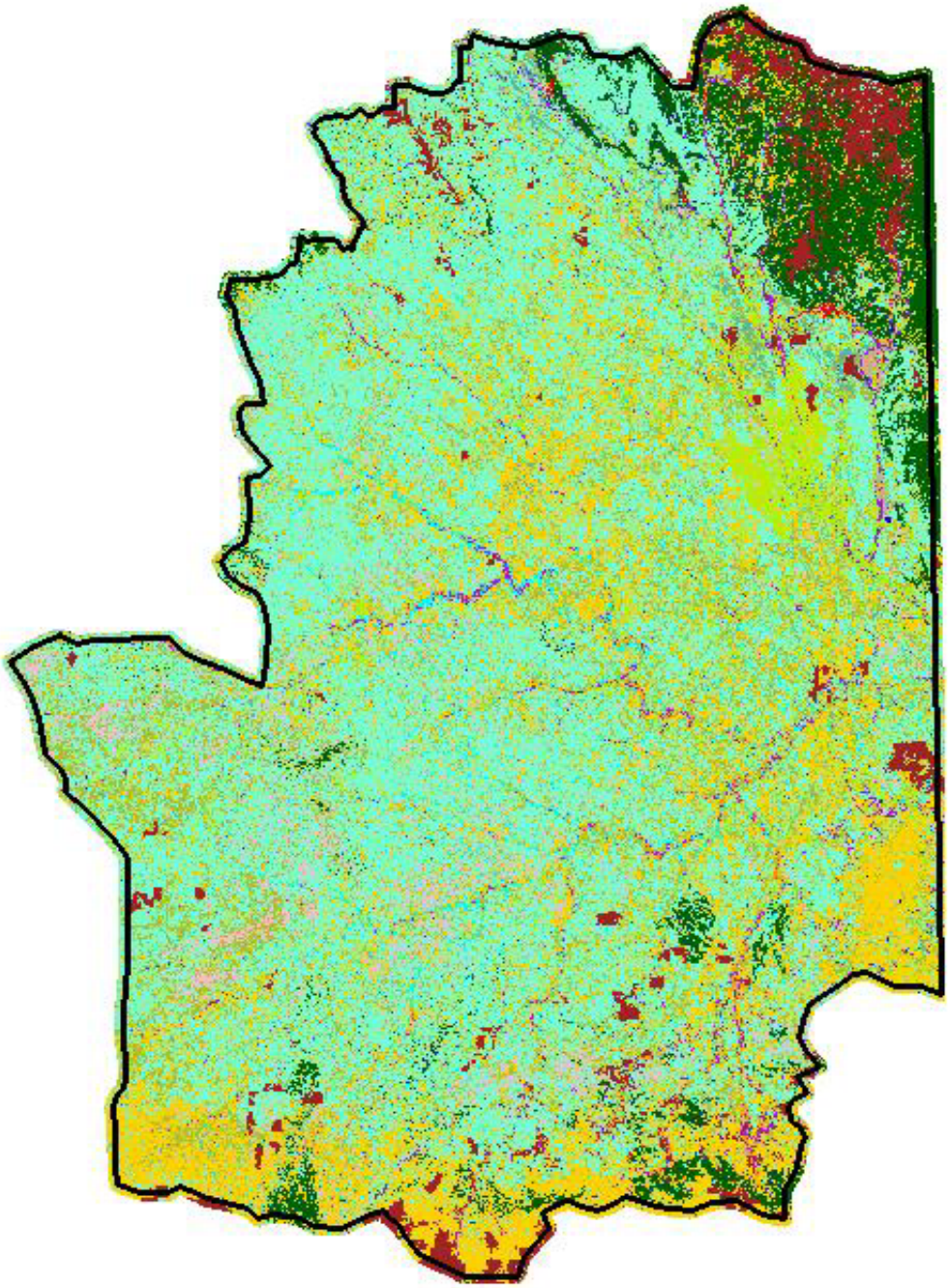


Figure 3. Initial vegetative classification for Thunderbasin herd unit.

HABITAT PROJECTS

Laramie Range Habitat Initiative Project

True mountain mahogany annual production increased from 0.64 inches in 2002 to 1.3 inches in 2003. The increase can be attributed to spring precipitation, which measured 8.74 inches from April 4, 2003 to July 7, 2003. Albeit a 51 percent increase over 2002, it is still a 64 percent decline in production from 2000. The decline may be attributed in part to poor plant health, condition and vigor. The plants within this community are mature to decadent with considerable amounts of dead branches, and we have documented very little, if any, seedling establishment.

	Mean Leader Length		
Year	Leaders Measured	Total Leader Length	Average Leader Length
2000	125	450.00	3.60
2001	250	339.23	1.36
2002	250	160.72	0.64
2003	250	325.73	1.30

Figure 4. Laramie Range true mountain mahogany plant.

- ✓ Overall 64 percent decrease in true mountain mahogany production since 2000.
- ✓ Overall, true mountain mahogany production increased 51 percent since 2002.
- ✓ Utilization levels are considered severe at the Deer Creek site, 52.4 percent actual use.
- ✓ Since 2000, annual production has declined 66 percent and 64 percent at Natural Bridge and Deer Creek, respectively.
- ✓ True mountain mahogany annual growth has increased 67 percent since 2001 at the Falkenburg site.

Bates Hole Habitat Inventory and Evaluation Area

A use index was developed to convey to the public how production and utilization was affecting the big sagebrush community; hence we developed a use index. The use index was derived by taking 35 percent, which is the level where percent leaders browsed is considered excessive, and dividing by the highest current year's growth observed during our monitoring efforts (use index = % leaders browsed (ocular estimate) / current year's growth (annual growth)). This formula establishes a threshold, which is depicted by the line where the red shaded area meets the green shaded area in Figure 5. At this point, utilization on current year's growth becomes excessive and may have detrimental affects on the big sagebrush community (i.e., decline in plant vigor, poor seed production, increased plant mortality, and reduced carrying capacity). Even though some use indices fall within the green shaded area, there are still impacts to big sagebrush plants and communities.

Figure 5 depicts the use indices over the last 10 years. During those 10 years, seven have been within the red shaded area, which is indicative of excessive use and detrimental impacts to big sagebrush plants. In those years where current year's growth is high and percent leaders browsed approaches 35 percent, the index approaches the threshold. Furthermore, the use index will increase proportionately as current year's growth decreases and percent leaders browsed increases. The inverse is also true, as current year's growth increases and percent leaders browsed decreases, the use index will decrease (fall within the green shaded area). At the present time, we have calculated the use index threshold for Bates Hole to be 0.213. A use index above this threshold means that percent leaders browsed is excessive and significant impacts to individual big sagebrush plants may be occurring. Therefore, we prefer to have more indices in the green shaded area, due to less severe impacts on individual big sagebrush plants. Since 1993, use indices have increased, which may be indicative of a big sagebrush community in poor condition. We prefer to see a decreased use index, which indicates production has increased and/or percent leaders browsed has decreased.

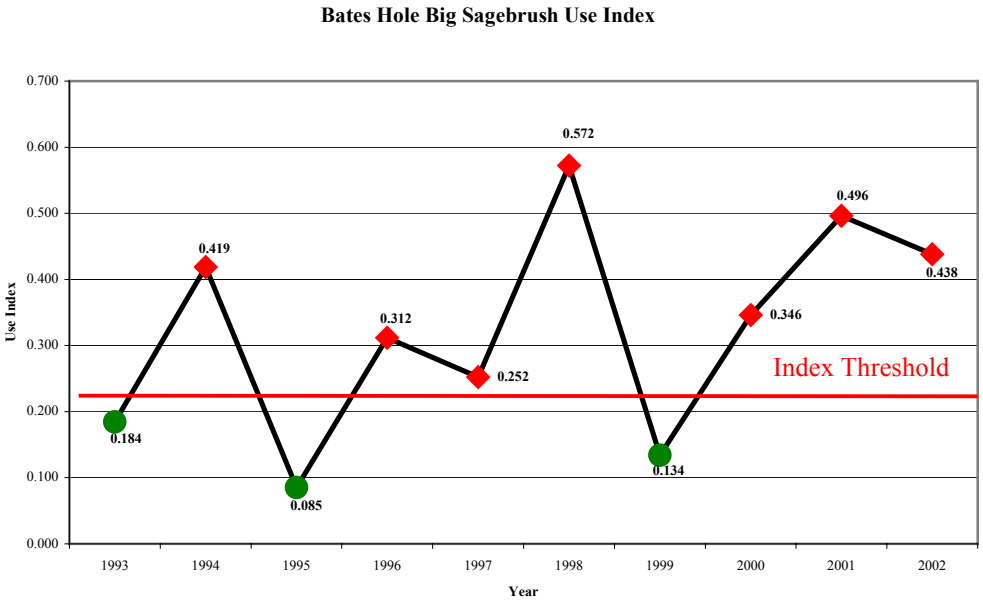


Figure 5. Bates Hole big sagebrush use index.

⇨ Overall 61 percent decrease in big sagebrush production since 1999.

⇨ 270 percent increase in big sagebrush production at the Lower Lawn Creek site, and a 110 percent increase at the Schnoor site. Even though the significant increase, we still documented only 0.56 inches and 0.44 inches at each site, respectively.

⇨ True mountain mahogany production shows a 38 percent decrease since 2001.

⇨ Received initial land cover classification, which will be ground-truthed and accuracy assessed during the 2004 field season.

Big sagebrush production ranged from 0.34 inches at Upper Lone Tree Creek to 0.77 inches at Lower Lone Tree Creek. Overall production at six locations averaged 0.53 inches. As we have documented, spring (April-June) precipitation is extremely important for big sagebrush production. This year, the Bates Creek weather station received 1.76 inches of precipitation during the April through June timeframe. Figure 6 depicts the correlation between spring precipitation and big sagebrush production over the last ten years. As the chart illustrates, big sagebrush production has been on a downward trend since 1993. We believe this trend may be attributable to precipitation events and poor big sagebrush plant condition. The plants that occur within our sampling areas are over-mature and decadent with little, if any, seedling recruitment and/or young plants. Moreover, the opportunity to improve these stands is somewhat limited due to site potential (i.e., herbaceous production), and big sagebrush density. Nonetheless, we have implemented some fertilization test plots to determine if this approach will increase annual growth and/or forage quality. To date, we have not documented a significant increase in either quantity or quality. We are pursuing other management alternatives to find a technique that will increase big sagebrush quantity and/or quality.

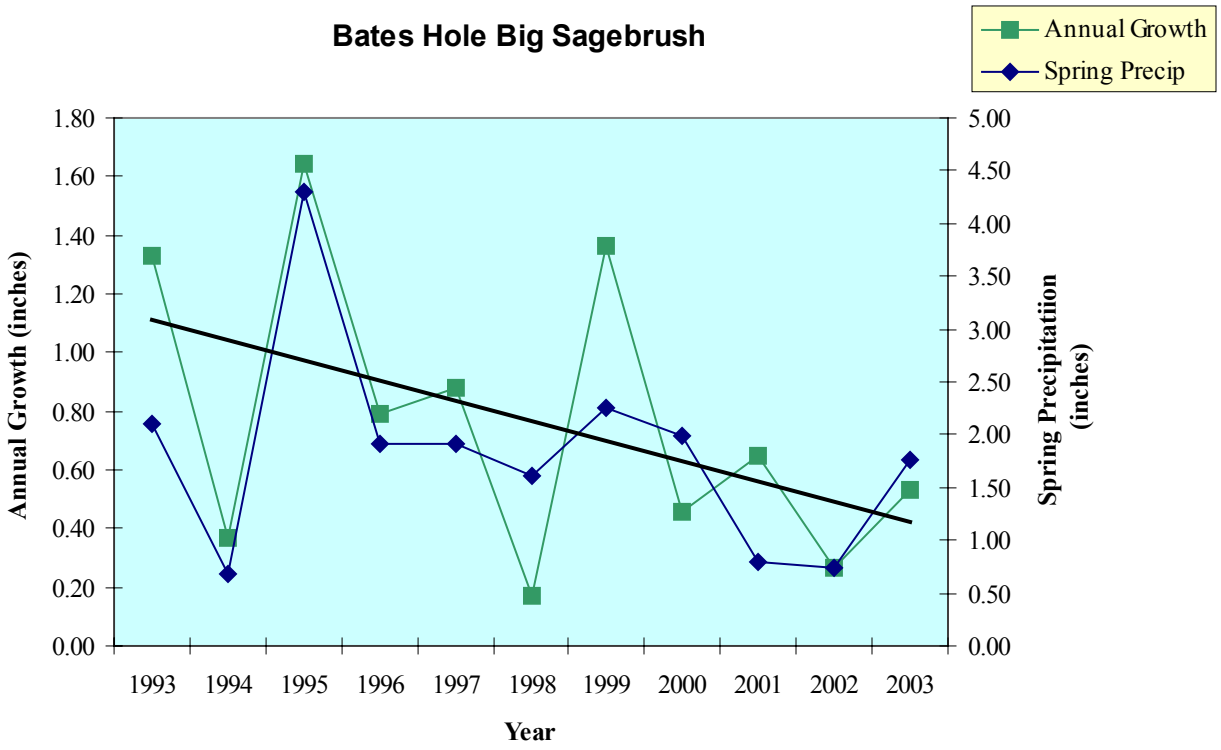


Figure 6. Big sagebrush annual growth response to spring precipitation.

Rattlesnake Hills Habitat Inventory and Evaluation Area

The use index in the Rattlesnake Hills is the exact opposite of that in Bates Hole (Figure 7). Out of nine data points, only two occur within the red shaded area or where percent leaders browsed is considered excessive. The remaining seven points are within the green shaded area, which is indicative of less severe impacts to individual big sagebrush plants, but there are still impacts. We have calculated the use index at 0.259, which is the threshold where percent leaders browsed is considered excessive and detrimental impacts to big sagebrush may be occurring. In 2000, we documented a significant increase in utilization, primarily from wintering domestic sheep, which contributed to the spike in the use index.

- 56 percent increase in big sagebrush annual growth in the Rattlesnake Hills sampling sites.
- Big sagebrush annual growth ranged from 0.69 inches to 1.33 inches.
- Big sagebrush production in the Rattlesnake Hills is a downward trend since 1994.

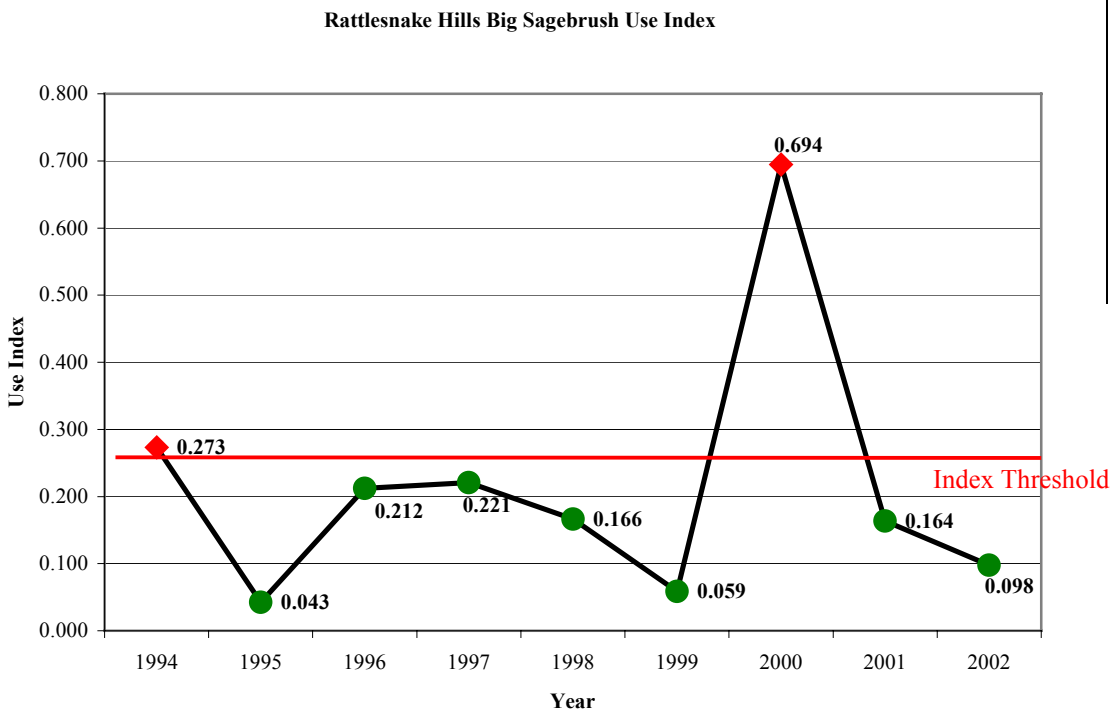
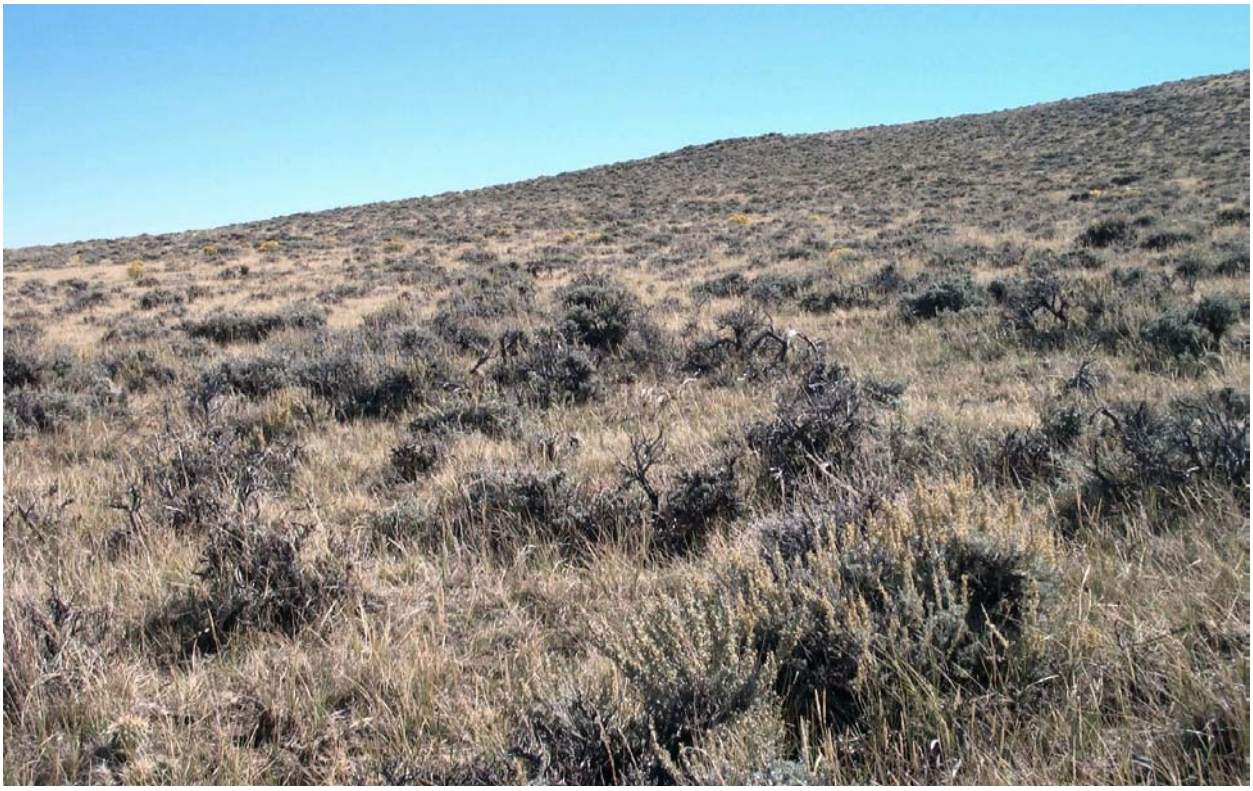


Figure 7. Rattlesnake Hills big sagebrush use index.

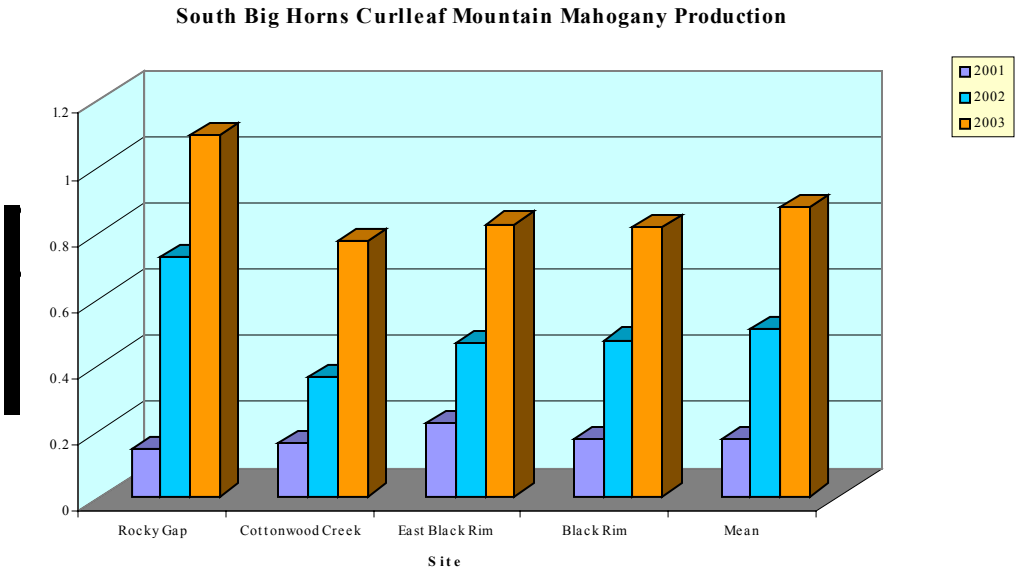
Big sagebrush plant condition in the Rattlesnake Hills.



Big sagebrush community condition in the Rattlesnake Hills.

South Big Horn Habitat Evaluation Area

Curlleaf mountain mahogany production increased 74 percent over the last year; 0.50 inches in 2002 to 0.87 inches this year (Figure 8). Albeit an increase, we are still below the potential of this community. The plants should be younger, more vigorous, and not as severely hedged. Nonetheless, we have documented an increase, which will be beneficial to wintering mule deer.



- Overall 74 percent increase in annual growth of curlleaf mountain mahogany.
- Documented a 114 percent increase at the Cottonwood Creek site, and a 78 percent increase at the East Black Rim site.
- Curlleaf mountain mahogany annual growth ranged from 0.77 inches to 1.09 inches.

Figure 8. South Big Horn curlleaf mountain mahogany production, 2001 - 2003.

Curlleaf mountain mahogany plant condition.

Curlleaf mountain mahogany community condition.

National Grassland Big Sagebrush Inventory

Big sagebrush production in the National Grassland project area decreased 22 percent in 2003. The decline could be attributed in part due to big sagebrush plant condition at 6-mile basin and Frog Creek. Ocular observations suggest the big sagebrush plants at these 2 sites are in worse condition than the plants at the Highway 85 site. We have documented a downward trend in production at the Frog Creek and 6-mile basin sites, whereas we have an upward trend at the Highway 85 site (Figure 9).

- Documented a 183 percent increase in big sagebrush production at the Highway 85 site since 2001.
- Documented a 47 percent decrease at the Frog Creek site, and a 51 percent decrease at the 6-mile basin site.
- Big sagebrush annual growth ranged from 0.41 inches to 0.99 inches.

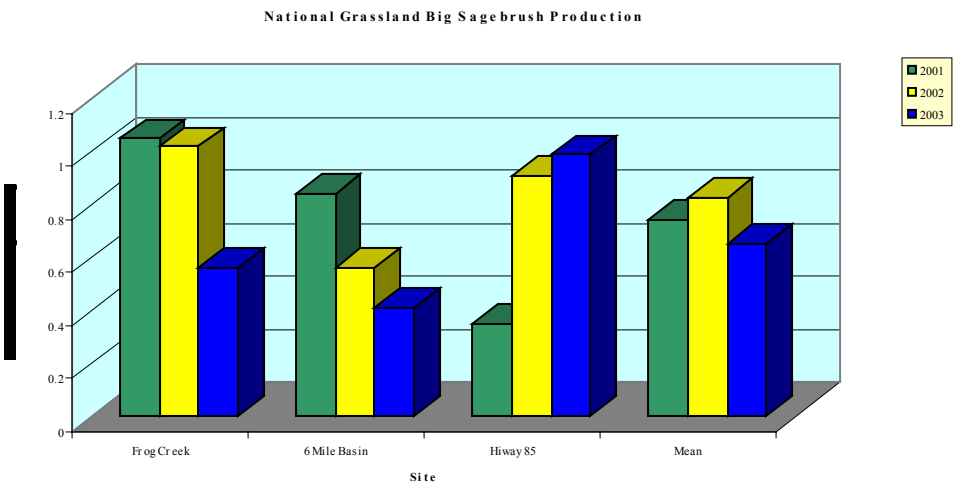


Figure 9. National Grassland big sagebrush production.

North Platte River Temperature Study

Low water levels in 2003 provided the opportunity to study the effects of low summer flows and high air temperatures on water temperatures in the 87-mile section of the North Platte River between Alcova Dam and the Dave Johnston Power Plant. The stretch of river is renowned for its trout fishery – among the best in the country – estimated to return $4,000,000 annually to the region.

The Bureau of Reclamation was able to provide flows of 2,200 cubic feet per second (cfs) until August 8th when they dropped the flow to 1,000cfs. Flows were further decreased to 500 cfs. Modeling showed that daily maximum water temperatures warmed from 28^{o}F cooler than air below Gray Reef Reservoir to 14^{o}F cooler than air at the power plant under the 1,000 cfs flow regime. Under the 500 cfs flow regime, the river was 20^{o}F cooler than air at Gray Reef and just 6^{o}F cooler at the power plant (Figure 10).

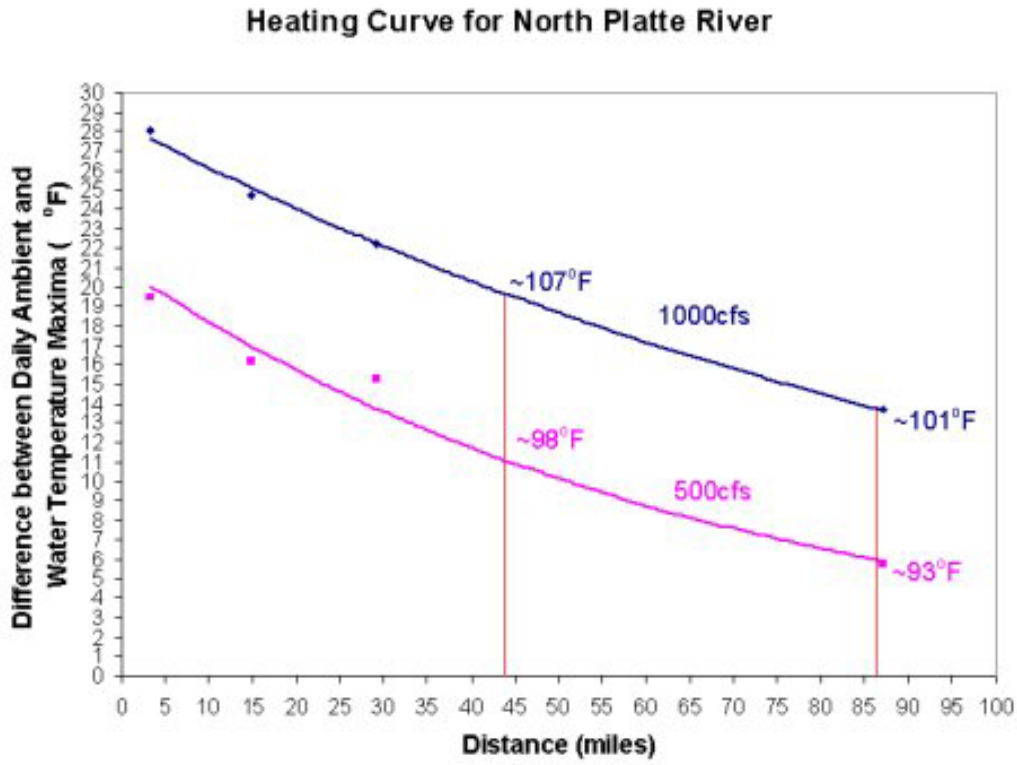


Figure 10: Warming curves for the North Platte River between Alcova Dam (Mile 0) and Dave Johnston Power Plant (Mile 87). Water temperatures are acutely lethal to trout when they reach 87°F. At Mile 87 mortalities could have been expected at 1,000cfs if air temperatures had reached 101°F, or if air temperatures were 93°F at 500cfs. At Mile 44 (the Game and Fish Casper office) trout mortalities could have been expected at air temperatures of 107°F at 1,000cfs and 98°F at 500cfs.

The highest air temperature experienced before August 24th was 98°F and 91°F thereafter. No mortality was observed, but the model indicates that air temperatures came within three degrees of causing some mortality near the power plant before August 24th and two degrees thereafter. The fisheries management crew noticed poorer condition in the more downstream fish relative to those upstream. This study will be expanded next year to assess sub lethal effects of temperature on trout.

Miracle Mile Spawning Habitat Enhancement

Since the construction of Kortes Dam, a great tailwater fishery has developed between Kortes Reservoir and Pathfinder Reservoir. The fishing has been so good historically that the short section of river has been dubbed the Miracle Mile. Recruitment of fish has decreased over recent years, and the lack of spawning gravel is considered to be a cause. In that sense the presence of the dam is a double-edged sword; it provides cool, productive water throughout the summer; but it also cuts off the upstream gravel source to the river. Characteristics of the only good spawning reach left in the Miracle Mile were measured, and a rigorous analysis was made of several potential sites for the development of additional spawning habitat. The site exhibiting channel and floodplain geometry most similar to the downstream spawning reach was selected (Figure 11). A natural rock weir will be installed to contain spawning gravel that will be added to a depth of more than a foot. If all the gravel area is used by spawning trout, there is room for hundreds of redds, or trout nests. The Bureau of Reclamation has committed $15,000 to the project. Construction activities are expected to begin in January 2004.

Figure 11: Color infrared photograph of the project site including measured transects that were used for site selection, and the proposed construction access road and materials storage site. Flow is from bottom to top.

Habitat Extension Services Projects

Riparian Restoration Projects

This year, six riparian restoration projects were written, funded and initiated. These totaled 315 acres along six drainages in Crook and Weston Counties. All of these projects were funded through the USDA Farm Bill's Continuous Conservation Reserve Program. One was also funded through a WGFD Habitat Grant. These projects required the installation of fences to exclude livestock grazing for a 10- or 15-year period and tree and/or shrub planting, over a two-year period, to reestablish woody vegetation where needed. Water developments were also included where livestock access to water had been lost due to fencing. Seven more riparian restoration projects are in the planning stages on various drainages in Crook and Weston Counties.

- Volunteered at the Wyoming Hunting and Fishing Heritage Exposition.
- Lead contact for WGFD on Casper BLM Field Office RMP revision.
- Pronghorn Working Group member.
- Conducted CWD surveillance at local meat processing plants.
- Conducted warmwater stream assessments on Poison Spider Creek, South Fork of Powder River, and Salt Creek.
- Participated in Warmwater Stream Assessment Steering Committee.

Pre-project photo of a riparian restoration project along Black Thunder Creek in southwest Weston County.

Wetland Development and Enhancement Projects

Three small, shallow wetlands were constructed this year in Weston County with the cooperation of the Natural Resources Conservation Service (NRCS), U.S. Fish and Wildlife Service (USFWS), Ducks Unlimited were completed this year in Weston County with funding by the NRCS. At least two more restorations and one reservoir are planned for next year involving several funding partners.

Oil Creek #1 Reservoir soon after completion.

Upland Habitat Enhancement Projects

Approximately 25,300 acres on several ranches (including public and private lands) were evaluated and grazing management assistance given to producers. As needed, cross fencing and livestock/wildlife watering facilities were planned and implemented with NRCS funds. Two of these ranches also had funding provided by the Wyoming Water Development Commission's Small Water Project Program through cooperation with WCNRD.

MISCELLANEOUS

Several WGFD employees participated in the Black Hills Natural Resources Conservation Youth Camp held at Mallo Camp in Weston County. Children from Campbell, Crook, Niobrara, and Weston counties participate in the event every year for a few days of fun and learning.

Black Hills Natural Resources Conservation Youth Camp

Workshops and In-service Training

- Wyoming Stockgrowers/Woolgrowers annual meeting
- Chronic Wasting Disease surveillance training
- Big sagebrush Ecology and Management workshop
- Western States Mule Deer/Elk Management workshop
- ArcGIS Decision Support System training
- Remote sensing training
- US Fish and Wildlife Service Candidate Conservation Agreement with Assurances, Safe Harbors Agreement and Habitat Conservation Plan workshop
- ArcView – ArcEditor video teleconference workshop
- International Society for Range Management meeting
- Cheatgrass Awareness Conference
- Water Law workshop
- AFO/CAFO (Animal Feeding Operation/Confined AFO) workshop
- Conservation Reserve Program training
- All Bird Conservation workshop

Habitat Protection

- Wyoming Game and Fish Department lead contact on Casper BLM Field Office Resource Management Plan revision

Presentations and Public Contacts

- Central Wyoming Fair booth
- Winter Outdoor Recreation Education Opportunity presentation
- Natrona County Master Gardeners presentation
- Cheatgrass Awareness Conference presentation
- Willow plantings along Casper's Platte River Parkway with cub scouts
- Delivered seminar on ice and winter fish habitat to school teachers' continuing education

- Developed aquatic habitat themed miniature golf course for Hunting and Fishing Expo
- Demonstrated river dynamics with stream trailer at the statewide Children's Water Festival
- Taught school children about pond invertebrates at Yesness Pond, Casper
- Taught school children how to cast with fishing rods in Glenrock
- Delivered a seminar on Arctic char history, habitat and propagation to WGFD fish division

Extension

- Evaluated the potential for increased trout production along a private section of Sage Creek in Carbon County for a landowner interested in guiding anglers on the stream and provided recommendations.
- Developed a plan to deliver cool water with fishery development recommendations to a Platte County landowner interested in rehabilitating a breached reservoir for trout fishing.
- Provided professional opinion on a dispute between a Converse County landowner and the Department of Transportation concerning the diminished capacity of a spring pond due to a sedimentation inflow event resulting from road improvements. Provided options for pond rehabilitation.
- Installed a pond-leveling device to foil beavers that repeatedly flooded a Natrona rancher's access road to his cow camp.
- Tended the WGFD information booth at the joint Wyoming Stock Growers Association and Wool Growers Association annual meeting.
- Provided professional expertise regarding fish and wildlife habitat needs to the U.S. Forest Service's Medicine Bow Forest Plan revision, and the Bureau of Land Management's Rawlins and Casper Resource Management Plan revisions.
- Examined proposed stream enhancements for a Converse County ranch to accelerate approval by the Army Corps of Engineers.

Habitat Assessment

- Exacted Wyoming Habitat Assessment Methodology on Dugout Creek, Muddy Creek, Bed Tick Creek, Horseshoe Creek, and the South Fork Powder River.
- Participated in Warmwater Stream Assessments of Salt Creek, South Fork Powder River, and Poison Spider Creek.

Committees

- Commercial Aquaculture Review Team – Committee dedicated to diminishing negative environmental and economic damage to Wyoming's aquatic wildlife resulting form aquatic nuisance species and disease.
- Warmwater Stream Assessment Steering Committee – Committee guiding a post-doctoral student at the University of Wyoming who is developing a warmwater stream assessment methodology for the Wyoming Game & Fish Department.

CODY REGION

HABITAT PROJECTS

Owl Creek/Meeteetse Mule Deer Habitat Evaluation

The three-year Owl Creek/Meeteetse Mule Deer study was completed and final report written. Winter and transitional mule deer seasonal ranges within the Owl Creek/Meeteetse Mule Deer Herd Unit were evaluated to assess trend in habitat conditions over the last 20-40 years. Existing trend studies established between 1965 and 1982 were located re-read, and additional studies were established to determine condition of sagebrush stands. Although three years of severe drought before and during the study confounded the interpretation of trend, several vegetative trends with implications to mule deer habitat and populations were apparent. Sagebrush communities, especially on winter range, show a trend towards greater canopy cover, older age class and more decadence of sagebrush plants (Figures 1 and 2). This apparent trend towards later seral plant communities represents a potentially negative impact to mule deer, a species that is adapted to early-mid seral communities. Conifers, particularly juniper and limber pine, have increased in many areas and have encroached onto deeper soils that normally support

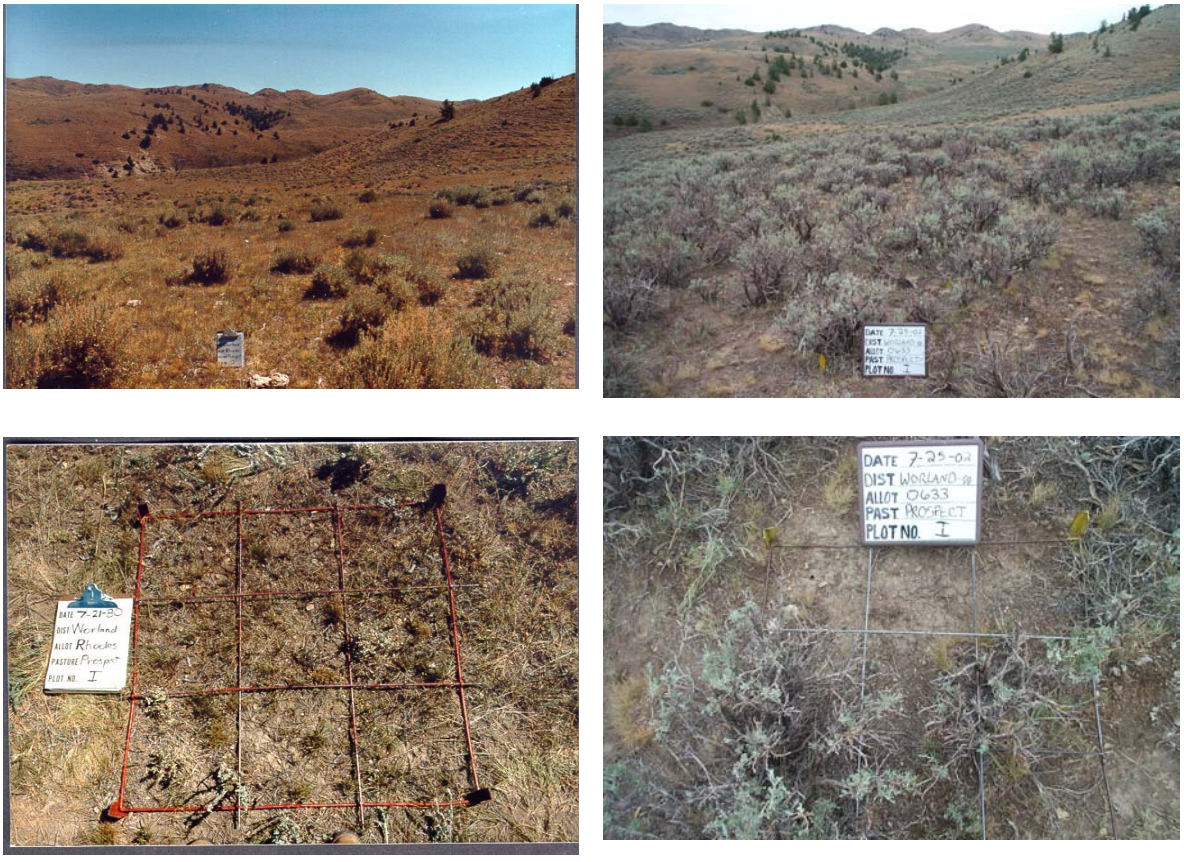
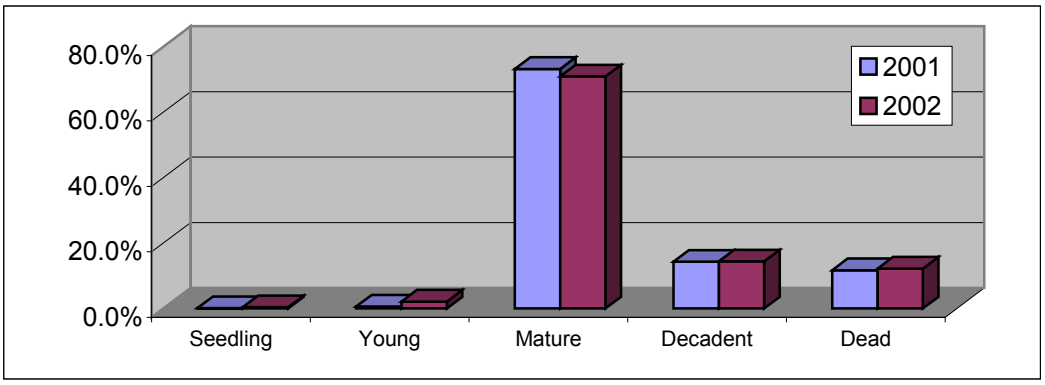


Figure 1. Twenty-two years of change. The photos on the left were taken in July, 1980; the photos on the right were retaken in July, 2002. The evident change is typical of most trends observed at monitoring sites—a trend towards greater sagebrush canopy cover and older age class plants.



sagebrush communities. The cause of these trends are likely the lack of disturbances that produce earlier successional stages (Table 1). The Department recommends judicious treatments of both conifer and sagebrush communities to provide a diversity of successional stages supporting healthier sagebrush plants and herbaceous understory. Heavy livestock
grazing concurrent with severe drought appears to have an effect on available forage for mule deer. The Department recommends lighter livestock stocking rates to accommodate expected drought cycles. A strong relationship between growing season precipitation and mule deer productivity during specific

Table 1. Summary of disturbance activities since 1960 over the 1,036,000-acre study area. Succession was allowed to advance relatively unchecked for the 20 year period from 1970-1990.

	Acres by Disturbance Type				
Years	Wildfire	Prescribed Fire	2,4-D Herbicide	Tebuthiuron Herbicide	Total
1960-1969	0	0	23,558	0	23,558
1970-1979	0	0	0	0	0
1980-1989	554	1536	0	0	2,090
1990-1999	519	22,290	0	532	23,341
2000-2002	18,850	2,027	0	0	20,877
Total	19,923	25,853	23,558	532	69,866

series of years suggests that climatic conditions, acting with other factors may be influencing productivity in a predictable manner (Figure 3). This relationship merits further study. The Department recommends repeating collection of certain data during more normal precipitation years to gain a better understanding of effects of severe drought on mule deer and their habitat as well as to validate our interpretation of long term trend in habitat conditions within this herd unit.

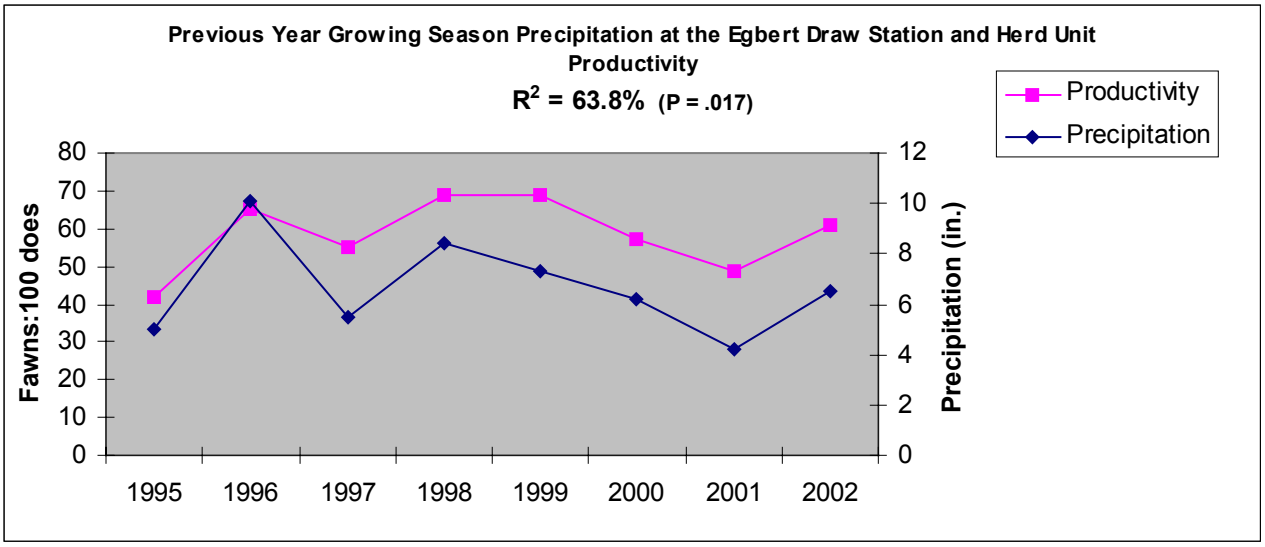


Figure 3. Series of precipitation and productivity data exhibiting a good fit.

Trapper/Medicine Lodge Grazing Management

The Trapper/Medicine Lodge Grazing Management was a cooperative project between RMEF, USFS, WGFD and permittees to improve grazing management for wildlife and other resources on a 35,317-acre area on the Bighorn National Forest. A contribution from the RMEF allowed the previous permittee of the Trapper Creek C&H Allotment, Martin Michelena, to waive half (569 AUM's) back to the Forest Service with no preference for reissue. The remaining 569 AUM's were waived to and acquired by the adjacent permittee of the Dry Medicine Lodge Allotment, Hamilton Ranch Inc. An environmental assessment proposes to combine these two allotments into one allotment called Medicine Lodge-Trapper Creek C&H&S. The buyout plus other reductions over the past 10 years have resulted in a 50% reduction of the historical stocking level. In addition, an interim grazing management system that incorporated Hamilton's Fool Creek/Fish Hook Allotment was developed which allowed an average stocking rate of 10.1 acres/AUM for the two allotments. This grazing management system will be finalized in an environmental assessment and AMP that are currently being developed. The grazing management system will allow approximately 1,000 acres of high elevation elk summer range within the Cloud Peak Wilderness to be excluded from future livestock grazing rotations.

Photo of meadow on South Trapper Creek, Trapper Creek Allotment taken in late August. The reduction of stocking rate areas such as these to be grazed lightly or not at all by livestock, leaving more forage available to wildlife.

Habitat and fisheries biologists electrofishing a section of West Kirby Creek. The base-line data will allow evaluation of the effectiveness of management changes on water quality and aquatic habitat.

Kirby Creek Coordinated Resource Management

The Kirby Creek CRM is a cooperative effort between WGFD, other agencies and landowners to restore ecological functions within the Kirby Creek watershed. The CRM applied for and received a grant from the Wyoming Water Development Commission for a Phase 1 Reconnaissance Study of the watershed. The study, which is being conducted by a private consultant, will assess the condition of both riparian areas and uplands and identify where problems are occurring. In conjunction with this effort, the Hot Springs Conservation District applied for and received a Wyoming Department of Environmental Quality 319 Water Quality Grant for Kirby Creek. The grant will enable the Kirby Creek CRM to implement Best Management Practices on Kirby Creek to improve channel stabilization and reduce sediment loads. WGFD personnel collected data on fish populations in Kirby and West Kirby Creeks to provide baseline data to supplement other information being collected within the watershed.

North Fork Vegetation and Fuels Management Project

In 2002, the Shoshone National Forest began the North Fork Vegetation and Fuels Management Project to address an advanced state of succession in vegetative communities within the North Fork of the Shoshone River watershed. The impetus of this effort is the starkly evident infestation of Douglas fir and spruce beetles that have caused 40-90% mortality in timber stands within the watershed. The WGFD is coordinating with the Forest to design treatments that will benefit wildlife habitat. WGFD personnel identified over 5,000 acres of treatment areas for wildlife habitat enhancement along the North Fork corridor. The treatment objective in most of these areas is to reduce juniper and limber pine encroachment into sagebrush communities. The treatments will benefit a multitude of species but were primarily targeted to improve bighorn sheep and elk habitat.

Juniper and limber pine encroachment into sagebrush/grass communities that provide crucial habitat for wintering bighorn sheep along the North Fork corridor. Prescribed fire treatments will remove conifers while enhancing herbaceous forage.

Absaroka Conservation Initiative

The RMEF, in cooperation with the WGFD other non-profit and governmental agencies and landowners, kicked off the Absaroka Conservation Initiative with a planning meeting and social gathering at the Buffalo Bill Historical Center in July. The initiative is an effort to preserve the historic ranching, wildlife, scenic and community values along the Absaroka Front, an area identified by the RMEF as the highest priority for elk habitat in Wyoming. The Department displayed several booths at the event and took part in a round table discussion of the key issues and challenges facing landowners and land managers in this important area. The key issue identified was the loss of habitat and open space to development. The Department will continue to cooperate with the RMEF and other partners in this important endeavor.

Gooseberry/Cottonwood Watershed Enhancement Project

This project is a landscape scale approach to noxious weed control and riparian habitat enhancement within the Gooseberry and Cottonwood Creek watersheds. Salt cedar, Russian olive and Russian knapweed are a significant vegetative component within the project area which includes approximately 200 perennial stream miles and over 400,000 acres. Numerous funding sources have or will be targeted to help fund the effort, including Riparian Buffer CRP, pending federal legislation, Hot Springs and Washakie County Weed and Pest, BLM, and numerous private organizations. Both BLM and Weed and Pest have been very cooperative and have come up with significant funding and are planning to hire a two man crew that will focus solely on weed control within these watersheds. Landowner interest and participation is high and numerous CRP contracts have already been written and implementation of practices will begin this spring. Arsenal® and Garlon 4® will be the primary chemicals used to achieve initial control of salt cedar and Russian olive. They will be applied using various methods including backpack sprayers, horse-pack sprayers, 4-wheelers, pickups, and helicopters. All treatment efforts will

focus on starting at the top of each tributary and moving down stream. Two years post-chemical treatment, dense stands of dead salt cedar and small Russian olive will be crushed or shredded using a Lawson® Aerator outfitted with a drop seeder and/or a Timber Ax®. Large Russian olive will be left standing or mechanically removed with larger equipment when additional funding is secured. Grass and forb seedings and woody species plantings will be undertaken the following spring to boost regeneration of desirable species and to help compete with the invasion of other weedy species that will likely occur. All riparian corridors enrolled in CRP will be fenced to exclude livestock grazing during the 15-year contract period which will improve success of revegetation efforts and allow better grazing management after the contract expires. Off-site watering facilities or water gaps will also be incorporated into each landowners plan to help improve their grazing management flexibility.

Riparian area on Cottonwood Creek infested with salt cedar

Heart Mountain Grassbank

The Heart Mountain Grassbank, operated by the Nature Conservancy, provides a mechanism whereby livestock forage values can be exchanged for desired conservation outcome. The Heart Mountain Ranch irrigated meadows provided forage for three operators in 2003. Conservation benefits included prescribed burns, brush mowing and relief of crucial grazing areas during drought. Department personnel serve on both the grassbank advisory council and the selection committee for grassbank participants.

Luce Reservoir Phase II Habitat Improvement

Luce Reservoir is a trophy fall rainbow trout fisheries, as well as an irrigation reservoir for local ranches. In 2001 the outlet failed. In 2002 a cooperative habitat grant was funded and a new water level control structure and fish screen were installed. Second phase plans included ensuring dam life by riprapping the dike to protect it from wave action, and improving fish habitat by increasing the depth four to five feet. In 2003, trust fund dollars were used to obtain and place rock riprap on the dam face. Prior to funding availability, however, unusual spring moisture filled the reservoir higher than expected and wave action,

Luce Reservoir wave erosion.

Luce Reservoir dam repaired and reshaped

Luce Reservoir dam with riprap protection.

resulting from the site's long wind fetch, had already begun to erode the dam. The Two Dot and Paint Creek Ranches completed the earthwork necessary to repair and reshape the dam prior to rock placement, and Department contractors completed the project in November.

Sunlight Creek Habitat Investigation

Initial steps toward development of a habitat improvement concept design were coordinated with US Forest Service hydrologists. High water flows were monitored and bank-full flow, which is integral to the planning process, was measured with the aid of the US Geological Survey. Bank-full flow was 627 cfs on May 28, 2003. In return for their assistance, habitat biologists' assisted Geological Survey personnel with flow measurements on the upper Clark's Fork River. The Park County engineer's office was contacted concerning permit requirements due to county flood insurance programs. No problems were foreseen but contact will be made again whenever a concept design is finalized.

Sunlight Creek at bank-full.

Sunlight Creek bank-full flow measurements.

Onset temperature loggers, recording temperatures once per hour since October 2000, were removed in the fall of 2003. Temperature is a major factor of fisheries habitat suitability, especially during low discharge periods caused by drought. High water temperatures in the summer can result in intolerable conditions, while cold winter temperatures can result in frazil and anchor ice that is also unfavorable to fish. Water temperatures also affect growth and recruitment. The following table indicates that cutthroat should survive in Sunlight Creek but that brook trout may have a slight advantage due to spring and fall temperatures staying below 50^{o} F. The highest temperature recorded during this sample period was 68^{o} and the lowest was 32^{o} F. The prolonged periods of 32^{o} may be due, in part, to logger placement but frazil ice is also a concern in this system. It is possible that the stream reach below the waterfall is low enough in elevation to have a different temperature regime and may be more suitable to Yellowstone cutthroat trout. Further investigation will be necessary to identify potential conditions above and below the waterfall to assist in management strategy decisions.

During WHAM Level 1 surveys in 2002, lower reaches of several Sunlight tributaries were found dry or nearly dry even though upper reaches were flowing. Local residents considered this abnormal and due to the current drought. Additional data was collected on three of these tributaries in 2003. June flows

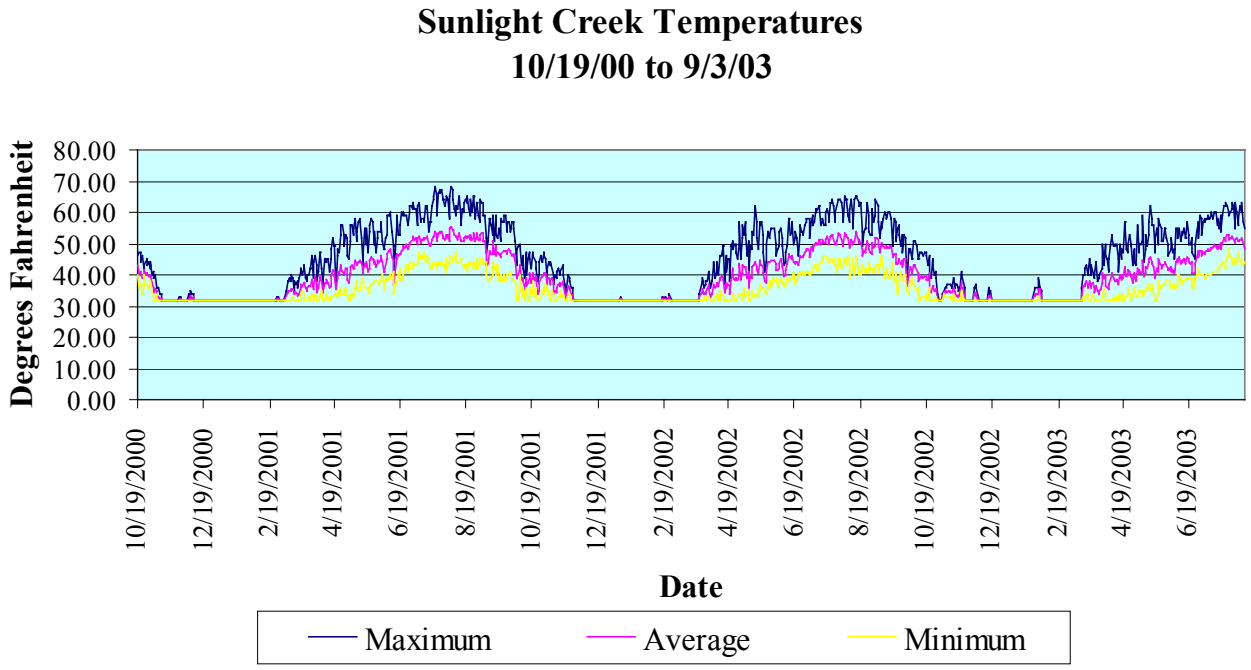


Figure 4. Sunlight Creek water temperatures.

indicate that these tributaries probably support adequate spring and summer flows to allow spring-spawned trout to hatch and move downstream to the main stem of Sunlight Creek prior to drying up, even in a drought year. Photos below show the difference between spring and late fall flows.

Little Sunlight – September 24, 2002 - lower reach dry.

Little Sunlight – June 12, 2003 - lower reach flows were 56 cfs.

Gas Creek – September 19, 2002
lower reach nearly dry.

Lower Gas Creek – June 12, 2003
lower reach flows were 26.1 cfs.

Spring Creek – September 13, 2002
upper reach low - lower reach was dry.

Spring Creek – June 12, 2003
lower reach flows were 28.7 cfs.

Clark's Fork Random Tree Jam Habitat Maintenance

In 2002, a broken eyebolt was discovered in structure #5. In 2003, further evaluation revealed two more damage points, a broken eyebolt on structure #2 and a broken cable on structure #6. A gas powered rock drill was obtained from the statewide construction crew, new eyebolts were glued into the boulders, and cables were reattached. The broken cable was replaced. All breaks were located at points that are underwater during most of the year, and at the point of boulder attachment. This probably resulted from log vibration during high flows. The sheared cable is considered unusual due to the use of half-inch, galvanized, aircraft cable. Cable clamps located high on the bank and out of the water were still in good condition but it was noted that several cable clamps, exposed to water for extended periods

Clark's Fork random tree jam structure #2.

of time, were rusted. Breakage potential appears minimal but rust was severe enough to prevent use of the threads. These problems will need monitoring to ensure structural integrity. This damage, however, is minimal since this is the first maintenance required on over 200 such connections installed in March of 1998.

Clark's Fork random tree placements broken cable on structure # 6.

Clark's Fork random tree placements example of rusty clamps.

North Fork Shoshone Habitat Survey

Tributaries of the North Fork provide critical spawning habitat for a very valuable fisheries including native Yellowstone cutthroat trout. These tributaries are deserving of careful management, but habitat conditions are often difficult to quantify. Observations have shown most of the tributaries to be flashy systems, with unstable banks, making it difficult to identify habitat features such as bank-full height. For this reason, efforts were made to identify bank-full flows in 14 tributaries during the 2003 high water period, stake the bank-full level, and measure discharge when safe conditions permitted. Additional data was gathered during low, fall flows including discharge, channel cross-sections, salinity, conductivity, TDS, and temperature. Photos were also taken.

Clearwater Creek (left) and Newton Creek (right) are both valuable spawning tributaries and represent the size variation within the Northfork Shoshone tributaries..

Trout Creek Irrigation Diversions

The project involves screening Yellowstone cutthroat trout from four irrigation ditches that capture many young-of-the-year fish as well as some adults. Designs were developed in 2003 and Trout Unlimited obtained funding. The project involves several landowners, irrigators, Trout Unlimited, State Parks and Historic Sites. Unfortunately politics and poor communication have not made agreement easy. Concerns also exist about the new techniques required to screen young-of-the-year size fish and the potential for canal blockage. In 2003, WGFD efforts were made to resolve the communication problems. One-on-one discussions were held with each landowner, State Parks and Historic Sites personnel, and Trout Unlimited. An agreement was developed and signatures were obtained from all parties involved. Another delay occurred when contractors, specified by the primary landowner, delayed their bid proposals. A meeting was held on-site with the contractor and landowner after which, the contractor agreed to provide a bid to Trout Unlimited within days. This, however, had not happened by the end of the year.

White Drain Habitat Grant Evaluation

This project, completed in 1999, was intended to filter high levels of sediment from adjacent irrigation system discharge prior to entering the Shoshone River, provide spawning habitat for native fish, and provide additional wetlands. The vegetation filter strip is working well and two additional ponds have been created that now contain trout, native cyprinids, frogs, and waterfowl. The clean water has removed over two feet of sediment from the lower drain, making spawning gravels accessible and a culvert near the mouth has been modified to improve fish passage. A temperature logger recording hourly temperatures within the lower drain for 28 ½ months was removed this year. Temperatures ranged from 33.0 °F in the winter to 74.0 °F in the summer. Spawning has not been documented yet, but even if fish do not spawn in the drain, this project provides a great example of what can be done by agriculturalists to clean irrigation return flows, improve water quality, and provide more fisheries habitat.

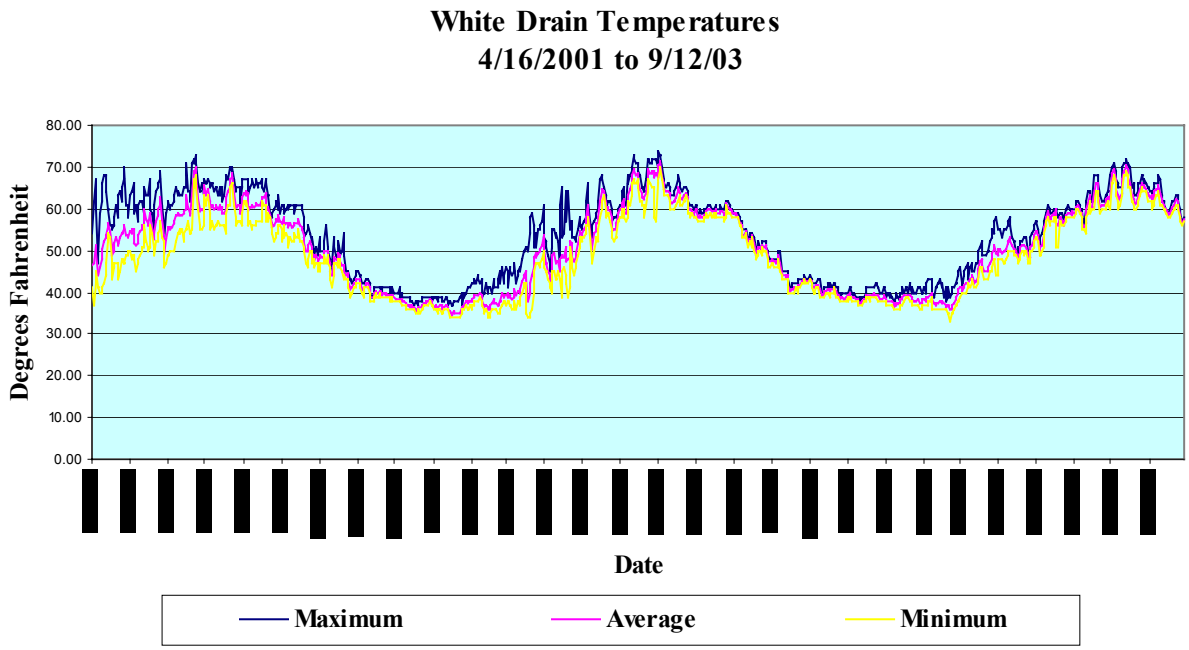


Figure 5. Recorded water temperatures in White Drain, 2001 – 2003.

Big Horn River Habitat Evaluation

An idea submitted to the University of Wyoming Cooperative Fish and Wildlife Research Unit was developed into a graduate student proposal. The proposal involves georectification of old aerial photography to 1:24,000 scale, comparing the data to newly available infrared orthophotoquads, documenting cumulative impacts, and delineation of fisheries habitats. Aerial photographs dating 1954 and 1981 were located and purchased from the US Geological Survey archives.

Big Horn River temperature logger site Lower Hanover near Worland.

Big Horn River temperature logger site ML Ranch near Lovell.

Onset temperature loggers, installed in the Big Horn River in 2000, were removed in June 2003. Temperatures were recorded once per hour for 29 months at the Lower Hanover site and 28 months at the ML Ranch site. Temperatures ranged from 26.6 °F to 88.0 °F with obvious periods of ice formation that kept temperatures at 32°F for long periods between December and February. Sauger habitat investigations in 1999-2000 showed that sauger use deep pool habitats in the winter, which would buffer temperature extremes. The ice forming temperatures documented with this data, further show the necessity of deep pool habitat within the Big Horn River. It is also interesting to note that temperatures remained very consistent between the two locations, which are located nearly 90 river miles apart.

Nowood River Habitat Survey

Native species including sauger and catfish are found in the Nowood River and it is known these populations migrate to and from the Big Horn River. Concerns exist that diversions in the Nowood River may inhibit or even prohibit upstream migration during some years. These diversions, constructed primarily of large pieces of concrete and rock, are sill type structures designed to backup and divert water for irrigation. Periodic maintenance modifies these structures so that upstream migration appears possible in some years, while migration in other years appears impossible.

In early June 2003, one of these diversions did not appear to prevent upstream fish movement. No drop-offs were observed as water flowed over the structure, forming rapids. Even a large tree that washed onto the structure did not appear to stop fish passage. In July, however, the associated irrigation canal was cleaned and a dirt dike was constructed on top of the rock diversion. The dirt dike spanned the river and was wide enough to drive a bulldozer. The dike completely dammed the river and eliminated downstream flow except for minimal flows percolating through the structure. Downstream water was

limited to pool habitat. The dirt dike was never removed but allowed to wash downstream during a high water, rainstorm event. Consideration is being given to design and construction of a diversion structure that would allow water to be diverted, while also allowing fish passage. More information is needed concerning irrigation needs, the swimming ability of the species present, what velocities they can navigate, and how long they can maintain burst speed.

Nowood River diversion concrete and rock construction.

Nowood River at high flow June 2003.

Nowood River dammed for irrigation water July 2003.

Tensleep Creek and Wigwam Rearing Station Improvements

Getting water to the rearing station's brood pond has been a developing problem for several years. Tensleep Creek splits into two channels above the rearing station, so a diversion has been used to divert low flows through the northern channel and past the Wigwam headgate. The diversion washed out however, and needed to be replaced. In addition, substrate has aggraded within the northern channel and Wigwam rearing station was not getting enough water during critical winter months. The southern channel has degraded during high flow events and even initiated the formation of a third channel, which was threatening the Wigwam access road and US Highway 16. High water flows lapped onto the access road and laminar flows actually flowed across the Highway in 2003, creating very dangerous conditions.

In October of 2003, the rock-filled, vertical culvert, diversion structure was reinforced by two rows of large (> 4 ft diameter) boulders. The upstream row of boulders was buried approximately 1/3 the height of the boulders and the downstream row was buried 2/3 the height of the boulders. The entire structure was lowered from the previous height, so that some of the migrating substrate will pass over it and down the southern channel during high flows. This will help rebuild the southern channel's bed while reducing aggradation in the northern channel, and still providing water to Wigwam.

The left photo shows boulders used in Tensleep structures. Boulders had minimum diameter requirements of four feet. The right photo shows two rows of boulders being installed to reinforce the rock-filled, vertical, culvert structure. The first row of boulders is 1/3 buried and the second row is 2/3 buried below the original streambed elevation.

To alleviate the aggraded condition of the northern channel, 1000 cu yds of boulder and cobble substrate were removed from the first 600 feet of the northern channel and stockpiled outside the riparian zone. The new stream channel design was based on the characteristics the stream reach directly upstream of the channel divergence.

The left photo is looking upstream to the head of the northern channel prior to improvements. The right photo is looking downstream from the same location after bed load removal and diversion repair.

In recent years, small boulders and cobble were rearranged into a diversion at the Wigwam headgate, either by hand or with a backhoe, on an annual or biannual basis. To prevent the need for annual maintenance, large boulders (> 4 ft diameter) were used to create a Rosgen style cross-vein, which guides water past the headgate at low flows, but is low enough in the middle to encourage high flows and

substrate to pass on downstream. This structure will be evaluated during and after the 2004 high flow event to determine modification needs.

Cross-vein diversion structure providing water to wigwam rearing station.

Looking downstream at the cross-vein diversion structure.

Jim Mountain Prescribed Burn

A portion of the Jim Mountain prescribed burn was accomplished with helicopter ignition despite high winds.

The Shoshone National Forest, in cooperation with WGFD and Foundation for North American Wild Sheep accomplished a portion of the Jim Mountain prescribed burn. Over 200 acres of limber pine and Douglas fir encroachment was treated before high winds shut down the aerial ignition operation. The objective of the burn was to reduce conifer encroachment and enhance forage for bighorn sheep. The remaining 2,000+ acres will be attempted in the spring of 2004.

Little Grass Creek Burn

The habitat extension biologist helped conduct spring and fall prescribed burning on intermixed private and BLM lands within Little Grass Creek drainage. The burn is part of a cooperative effort to improve habitat conditions within the Grass Creek Watershed. The prescribed burns are helping to improve wildlife habitat by rejuvenating decadent aspen stands, setting back Rocky Mountain juniper and limber pine encroachment, and increasing vegetative diversity, quality and quantity. This project is ongoing and burning efforts will continue in the spring and fall of 2004.

Little Grass Creek prescribed fire.

Habitat Extension

Aspen stand on private land scheduled for chain saw treatment.

Range interseeding project on private rangeland.

The habitat extension biologist made 42 one-on-one landowner contacts in 2003. These contacts resulted in new or continued planning for 24 different private land habitat enhancement projects. The projects include 13 new Riparian Buffer CRP projects (706 acres) planned and/or implemented, 3 WRP projects (16 acres planned, 12 acres complete), 1 WHIP project implemented (50 acres), 1 range inter-seeding project (20 acres) completed, 3 GRP projects (60,000 acres) planned, 2 stock-water pipelines planned (4-miles), and 1 aspen treatment project (25 acres).

Wildlife Habitat Management Areas

Sunshine WHMA

A new five year grazing lease was written for the Sunshine WHMA. An innovative approach was taken whereby the adjacent Forest Service grazing allotment was combined with the WHMA to form one mulit-pasture grazing system. The grazing lessee, who is also the permittee on the Forest, will now run one herd on both areas instead of running two herds simultaneously. The combination of the units allows a grazing strategy which will provide for better plant recovery and opportunity for growth as well as higher quality and quantity of forage available for wintering elk. Prior to the development of this strategy, management objectives on the WHMA were not being met. Duration of grazing in each pasture was too long and some areas were being overutilized. Other areas, because of poor livestock distribution were not grazed at all and were avoided by elk because of the rank vegetation and accumulation of previous years growth. To facilitate the new grazing system, water developments and pasture divisions will need to be constructed. The Area Improvement Project Agreement for 2003 consisted of the purchase of pipeline for a water development that will be constructed next year and the construction of a grazing exclosure to evaluate long term trends in relation to grazing management. Department personnel removed some unnecessary interior fences that were potentially impeding wildlife movement.

In the absence of grazing by livestock, grass in some areas of the Sunshine WHMA has become rank and has not been used by elk.

Yellowtail WHMA

New farm leases were implemented on the North Shoshone and South Shoshone farm areas. Whereas traditionally these have been cash leases with projects completed by the lessee in lieu of cash payments, the new leases were set up as share crop agreements. Of the 880 acres of irrigated farmland, 52 acres of

grains will be left unharvested each year under the new lease. In addition, the lessees seeded over 200 acres into permanent nesting cover.

The Yellowtail Area Coordinated Resource Management group continues to seek solutions to managing Yellowtails growing invasive plant program. The CRM consists of the four landowners on the Yellowtail WHMA (National Park Service, WGFD, Bureau of Land Management, and Bureau of Reclamation), as well as neighboring private landowners, the Bighorn County Weed and Pest, and others. The CRM group submitted a $77,500 proposal to the Fish and Wildlife Foundation for a "Pulling Together Initiative" grant. If awarded, the grant will enable the group to increase weed management efforts to the level needed to maintain the quality of wildlife habitat on this important area.

Grazing treatment shown after spring greenup. The grazed area on the left, while providing diversity and greater green forage availability, effectively creates a fuel break to stop or modify the behavior of a potential spring wildfire.

Prescribed grazing treatments were conducted for the second year on the WHMA. The objectives of the grazing treatment were to reduce fuels, invigorate decadent vegetation, create successional diversity and open up thick shrub stands. Three areas were grazed from the period of January 1-March 31 with over 300 cattle. The cattle were confined to pastures no larger than ¼ mile wide with electric fence. Several monitoring studies and one livestock exclosure were set up to determine the effectiveness of the grazing treatments. A $1000 grant from the Wyoming Private Grazing Lands Team enabled the construction of the exclosure and an educational field tour with range students from Northwest Community College. The students conducted nested frequency trend studies at four sites and helped construct the exclosure.

Three fuel break treatment areas were identified and mapped within the Shoshone River riparian area. The treatments would consist of hand crews sawing and removing shrubs and trees, primarily Russian olive, in a 100 feet wide strip. The objective is to create strategically located fuel breaks to break up the continuity of the dense river bottom. The project will be accomplished in the spring of 2004 using the Riverton Honor Farm fire crew and Department personnel.

Approximately 1,000 cubic yards of silt was removed from the tunnel portion of the Bigfork Canal. This created less resistance in the tunnel, and in turn an increase in inflow was possible, thereby providing more water for wetlands, nesting cover, food plots and crop-land irrigation. The tunnel portion of the Bigfork Canal is the limiting factor for water delivery to the North side of Yellowtail WHMA. Alternative funding sources are being sought for engineering and construction to allow replacement of the tunnel portion. The tunnels were built in 1933 and have exceeded their life expectancy.

Cleaning sediment out of the Bigfork Canal tunnel.

Approximately 2000 yards of material was hauled and placed on dikes at Ponds 1-4. The dike faces were reshaped, and the surface height raised to maintain integrity of the wetlands, which were level ditched in 2002. Ice, rodents, and wave action all contribute to the degradation of the dikes.

Renner WHMA

Three water developments were planned and funds procured for construction. Two of the developments will utilize water catchments and one will consist of a pipeline and off-site water tank out of Red Dick Creek. The water developments will enable better livestock distribution and a more complete implementation of a grazing strategy designed in 2001 to enhance forage for wildlife.

A 160-acre area on Buffalo Flat was treated with a combination of Plateau and Roundup herbicides to reduce cheatgrass. The area was drill seeded with a mixture of native and non-native grasses, forbs and shrubs. A permanent electric fence was constructed to exclude livestock grazing from the treatment and

to permanently create another pasture for the grazing system. Maintenance work, including dike maintenance, and repairing headgates and emergency overflows, was performed on the Renner Wetlands.

Sunlight WHMA

Weed mapping and treatment continued at Sunlight Basin and surrounding areas as part of the efforts of the Sunlight Basin/Crandall Weed Management CRM. Additional treatment funds were obtained from Wyoming Wildlife Federation and Rocky Mountain Elk Foundation. A summer weed tour was jointly hosted by Game and Fish, Shoshone National Forest, Park County Weed and Pest, and Cody Conservation District. The tour was attended by nearly forty people and identified several species of noxious weeds, treatment and mapping methods, and funding alternatives. It concluded with a meal and a power point presentation at the dance hall at Sunlight Basin WHMA.

The Sunlight meadows following growing season after fertilization.

The Sunlight meadows were fertilized to increase production. Measured production was 2,610 lbs/acre. This was accomplished using a fertilizer mix of soluble potash (15%), phosphate (18%), ammonium nitrate (35%), ammonium sulfate (31%), and zinc sulfate (1%) at 270 pounds per acre. Chemical treatment of noxious weeds, primarily Canada thistle, started in June and ended 8/27/2003.

MISCELLANEOUS

Watershed Management Education

The WGFD watershed trailer was used to demonstrate watershed functions and discuss the benefits of upland and riparian vegetation, percolation, water tables, grazing management, irrigation management, natural and accelerated erosion, gradient, meander patterns, subdivisions, culverts, bridges, stream structures, fish habitat, where to fish, water safety, and more. Additional props including houses, culverts, and bridges were constructed for better visual illustrations of watershed dynamics. A training session was given to Cody WGFD regional personnel so they were familiar with the program and better

able to use the trailer in the future. In addition, two US Forest Service personnel and two private citizens were signed up as volunteers and trained.

More than 60 adults and over 230 youth listened and interacted with demonstrations by the aquatic habitat biologist, the Greybull wildlife biologist, a USFS fisheries biologist, and a Worland teacher. Demonstrations presented included the following participants:

- The Kirby Creek CRM - Verbal and written comments were excellent and at least one, long-time rancher stated that he would implement new techniques based on the demonstration.
- Frannie Grade School - Three programs for students in grades 1-6.
- The Cody kids fishing clinic. Four presentations to kids and their parents.
- The Basin kids fishing clinic. Three presentations to kids and their parents.
- Worland High School. Demonstrations presented by a local teacher.

Wyoming Stock Growers Meeting

The aquatic habitat manager, aquatic habitat biologist, habitat extension biologist, and access coordinator attended the Wyoming Stock Growers meeting in Cody. Game and Fish set up and operated a booth where information and literature was provided, attended numerous presentations, and participated in committee meetings. Several discussions were held with growers concerning a variety of topics, including habitat improvement techniques, farm bill programs, and access programs.

Game and Fish booth prior to Wyoming Stock Growers meeting.

Example of literature provided at the Wyoming Stock Growers meeting.

- Coordinated with and provided information to the USFWS Yellowstone River Basin, Regional, and Washington DC Fish Passage Coordinators concerning fish passage needs and plans within the Big Horn Basin. Provided detailed information and photographs for potential funding.
- Trained with CWD sample methodology and collected samples at the Cody check station during opening weekend occasionally at the Cody Meat Locker and Cody WGF office when animals were brought in.
- Regional habitat priorities were modified, reviewed with the regional team, and GIS maps were developed for inclusion into statewide maps.
- Participated in the Cody region interagency meeting with the Cody and Worland BLM offices, the Shoshone Forest, Big Horn Forest, and WGFD personnel.
- Participated in the Shoshone Forest / WGFD fisheries coordination meeting.
- Participated in Fish Division computer user group.
- Provided environmental comments concerning various grazing allotments, oil and mining plans, and habitat improvement. Provided comments on the developing sagebrush management plan.
- Completed the Strategic Habitat Plan Accomplishments Report, combining aquatic, terrestrial, habitat extension, and construction efforts one regional report.

- Met with WYGISC Wyoming View personnel from the University of Wyoming to gain understanding of their program and how to coordinate future efforts.
- Cody office habitat display board was maintained with habitat techniques, grant information, project photographs, and newspaper clippings to provide habitat information and stimulate questions.
- Liaison activities with Senator Northrup
- Pheasant crow counts on Yellowtail WHMA
- Aspen tour with Dale Bartos on Bighorn Mountains
- S&G or evaluations on 6 BLM allotments
- Wapiti Ridge CRM
- Joint CDOW Tour
- Moose survey on Trapper/Medicine Lodge Creek
- WGFD Hunting Fishing Expo
- Education program on Ballinger Ranch
- Winter sage grouse habitat mapping
- Completed Draft Habitat Extension Bulletin on Wildlife Fencing
- Initiated Phase II Electric Fence Research
- Kirby Creek CRM
- Worked with FSA and NRCS to add new cost-share practice for Salt Cedar Control
- Hamilton CRM
- Wildlife use of sagebrush treatments presentation, Pinedale Ungulate/Energy Conference
- Wildlife habitat education presentation, Powell Senior High Students
- Beaver Ecology presentation, Worland Middle School
- All Bird Workshop, Billings, MT
- Tamarisk Symposium, Grand Junction, CO
- Bighorn Basin Exotic Plant Steering Committee Meeting
- Bighorn Basin Russian Olive/Salt Cedar Tour
- Member, Bighorn County EQIP Working Group
- Member, Washakie County EQIP Working Group

Training

Training workshops, professional meetings, and Department coordination meetings attended this year included:

- GIS Training
- Cheatgrass workshop.
- ESRI Software Teleconference.
- Water Law Workshop.
- Stock Growers Meeting.
- Fish Division Meeting.
- Fish Forum Meetings.
- Sagebrush workshop
- Regional Team Meetings.
- Fish Division Computer User Group Meeting.
- Deer and Elk Workshop

GREEN RIVER

HABITAT PROJECTS

Green River Region Habitat Evaluation and Sagebrush Shrub-Steppe Inventory

Time was allocated to the continued development of a proposal to complete a habitat evaluation and inventory of the Green River region in conjunction with the Pinedale region (Figure 1). A GIS based land cover/vegetation cover/ habitat type inventory is planned to assess current conditions, and evaluate trends over the past 30 years to help guide future wildlife and wildlife habitat management activities in the area. GIS technologies allow resource managers and biologists to analyze data and address specific problems at both small and large spatial scales in less time, and in a more cost-effective manner. Habitat types in the area range from alpine to salt-desert shrub community types and support a variety of wildlife species and potentially conflicting land uses. The inventory and change detection information will provide a basis for developing habitat treatment, restoration, rehabilitation, and mitigation projects and information for land managers, landowners, land users, and the public. The data is needed to guide future land use planning and will be invaluable in providing input into the BLM Kemmerer and Green River RMP revisions, county land use plans, and oil and gas developments. Change detection information will provide data on extent of loss and/or alteration of habitats and the degree and speed of recovery from past manipulations, treatments, perturbations, and/or man-made activities.

Funding has been received from the USFWS Sagebrush/Shrub-Steppe Ecosystems Grant program, the Wyoming Game & Fish Department Trust Fund, and a contribution from Exxon Mobil Production Company.

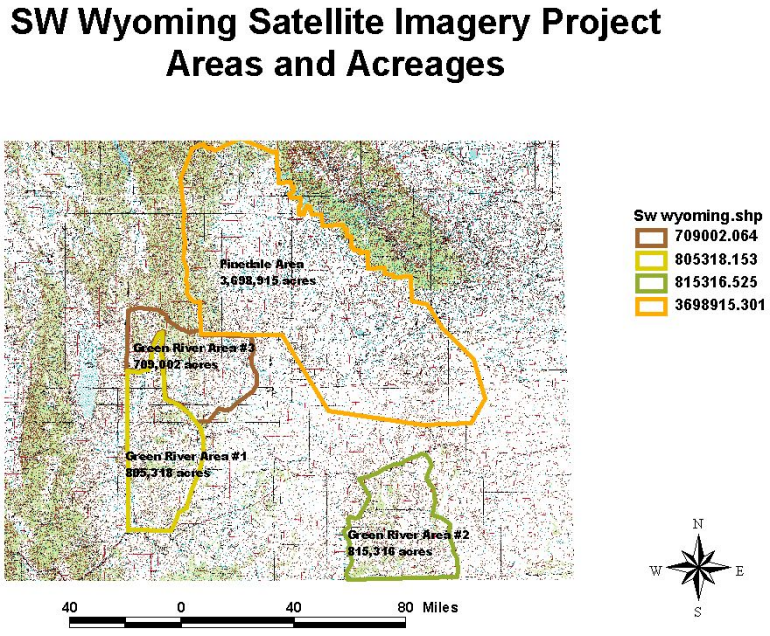


Figure 1. Southwest Wyoming satellite imagery project areas and acreages.

Sweetwater County Conservation District Federal WHIP Program Participation

Provided input to identify Sweetwater County wildlife habitat priorities and wildlife issues for participation in the federal WHIP program. Also provided habitat type descriptions to the Sweetwater County Conservation District working group for their proposal. Time was spent providing comments to the statewide WHIP technical committee on their statewide ranking criteria.

Improvement and Management of Sagebrush Communities in Wyoming Workshop

✓ Organized, planned, and implemented the Improvement and Management in Sagebrush Communities in Wyoming workshop.

Considerable time was allocated to the planning of the department sponsored Improvement and Management of Sagebrush Communities in Wyoming workshop. Extensive time was spent during the planning phase of this workshop obtaining sponsors, facilities, caterers, speakers, trade show vendors, providing for accommodations, outlining travel options, making invitations, posters and flyers, as well as putting together and maintaining a budget. Significant time was also spent on putting together an agenda and abstracts for attendees review, and actually hosting the workshop. The objective of the workshop was to present and discuss the current state of our knowledge on the ecology, improvement, and management of sagebrush communities in Wyoming. The workshop was held in Rock Springs during June, and was attended by nearly 150 participants from the Department, federal agencies, universities, agriculture interests, and the energy development industry.

✓ Final session included presentations regarding Sage Grouse and fire management in sagebrush communities.

Guest speakers included researchers, wildlife and land managers who presented information at technical sessions over the course of 4 days. One day was dedicated to a field tour of sagebrush communities located south of Rock Springs, where participants were exposed to sagebrush community types and succession, sagebrush species identification, cryptogamic soil crusts, invasive species issues, ecological relationships of associated vegetative communities, sagebrush treatments and management philosophies, and sampling methodologies (Figure 2). The final session reviewed the Guidelines to Manage Sage Grouse Populations and their Habitats and the Wyoming Guidelines for Managing Sagebrush Communities with Emphasis on Fire Management. Different federal and state agency representatives presented these management guidelines.

Figure 2. Ashley Green of the Utah DWR demonstrates shrub-monitoring techniques used to evaluate big game winter range condition trends in Utah during the sagebrush workshop tour.

Sagebrush (*Artemisia*) ecosystems occupy more than 37,000,000 acres in Wyoming. The steady loss and degradation of these ecosystems have generated an increasing sense of urgency in the conservation community. Long-term, range wide declines in sage grouse, has also attracted much attention. Yet, hundreds of other species that depend on the sagebrush ecosystem are at risk. This workshop was designed to address our experience and state-of-the art knowledge in restoring and improving components of the sagebrush habitats that are critical to sage grouse and other sagebrush obligate species.

✓ Workshop sessions were designed to address our experience in restoring and improving sagebrush habitat components.

East Richard's Mountain Prescribed Burn

During the first week of October, BLM fire management crews utilized a helitorch to mosaic prescribe burn approximately 6,000 acres of successionally advanced mixed mountain shrub communities and early stages of juniper encroached sagebrush-grassland habitat on the north and east slopes of Richard's Mountain. The burn project was located in the southwest segment of the Red Creek Watershed in the Daniels Creek Drainage. Goals of the project were aimed at restoring the ecological health of dominant vegetative communities in the area, thereby enhancing mule deer habitat and promoting sound watershed function. The BLM's planning and implementation efforts emphasized a finer scaled burn pattern mosaic of 40-50% (Figure 3), which is expected to enhance both short and long term wildlife habitat diversity within the project area.

✓ 6,000 acres of vegetation treated with prescribed fire in Red Creek Watershed.

Figure 3. An October prescribed burn treatment on the North Slope of Richard's Mountain resulted in a 40% to 50% burn pattern mosaic in mountain shrub and sagebrush-grassland communities.

2003 Fontenelle Prescribed Burn

The USDA Forest Service, Bridger-Teton National Forest, Kemmerer Ranger District burned 200 acres of willow bottoms and associated upland edges along Fontenelle Creek by aerial ignition. Objectives were to regenerate mature/decadent willows and enhance forage for moose, other big game, beaver and other species associated with beaver ponds. Rocky

Mountain Elk Foundation funds totaling $5,500.00 were allocated towards direct costs associated with this burn. Two burn units were identified for treatment and there are future plans to aerially ignite the remaining unit during Spring 2004, depending on a suitable burning window and funding. Soil conditions were good for this burn. After the fire, the underlying soil was moist and cool beneath a thin layer of ash. Vegetation response was good, despite the dry weather, and by mid-July willow shoots were two feet high. With the appropriate two-year livestock deferment the treatment should promote healthy regeneration of the willow community. This will result in increased forage production and improved overall watershed function in addition to providing habitat for a variety of wildlife species. Thistle beetles were also released as a biological control agent against Canada thistle, which is found within the treatment area. Treatments will be monitored through the Interagency Fire Effects Monitoring Program.

✓ 200 acres of willow bottoms burned to promote regeneration.

✓ Received $5,500 in funding from RMEF.

✓ Thistle beetles were also released as a biological control agent.

Currant Creek Ranch Beaver Habitat Enhancement

During the past two years, the owners of Currant Creek Ranch have allowed beaver colonies to extensively expand their distribution on the private lands along Currant Creek and assist in restoring healthy riparian habitat integrity and function. Currently, irrigation practices on the ranch are in a transition from flood to sprinkler irrigation, so beaver activity is not viewed as an impediment. The ranch is also diversifying from a total agricultural operation to a combination of guest and traditional ranching, where the wildlife wetland benefits of beaver ponds are appealing to landowners and their clientele. Moreover, the landowners recognize the ecological role beaver play in maintaining stream system stability through wetland development and ground water storage.

✓ Landowner using beaver to restore healthy riparian habitat.

During October, a crew of Department and BLM employees, volunteers, and the landowners selectively cut several mature aspen trees from Little Mountain and transported them by truck and trailer to active beaver pond complexes on the Currant Creek Ranch. Beaver utilized components of the freshly cut aspen trees that were either stacked at the pond's edge near the beaver dams or set adrift in the pond as construction materials to reinforce and elevate their dams. Much of the existing riparian shrubs along Currant Creek exhibit small diameter stems, so the 8-12 inch diameter aspen provided beaver with solid building material to increase dam stability and longevity (Figure 4). Stable beaver dams that do not breach readily during run-off flows often promote consistently elevated water-tables to provide an optimal environment for recruitment and rapid growth of willows and other woody riparian species (Figure 5), which is the primary goal of temporarily supplementing these beaver with aspen trees.

✓ Cut aspen trees provided to beaver to solidify dams and elevate streamside water tables.

Figure 4. Eight to twelve-inch diameter aspen tree materials provided to active beaver to enhance existing dam stability and longevity.

Figure 5. Beaver utilizing aspen materials to reinforce dams, expand pond sizes, and elevate water tables on private lands along Currant Creek.

Upper Ham's Fork River Basin WHAM – Level I Survey

Wyoming Habitat Assessment Method Level-I inventories were completed for the East Fork Ham's Fork, Burke Creek, Carl Creek, and Sawmill Creek Sub-Watersheds during the month of August in the Upper Ham's Fork River Basin. Data will be compiled and included in the habitat basin administrative report for the Upper Ham's Fork River Watershed once the project inventory phase is completed.

✓ Completed WHAM Level I inventories for 4 tributary watersheds within the Upper Ham's Fork River Basin.

Stream flow water temperature data collection was initiated during 2003 for selected tributary creeks draining from the west side of Commissary Ridge in the upper watershed. Streams flowing from Commissary Ridge all tend to exhibit a similar pattern of becoming intermittent, where stream flow becomes subterranean through geologic rock features located in steep topography. Flows resurface again downstream of the rock formations, where summer water temperatures appear to be exceedingly cold (mean daily summer temperature of 44-46^{O}F). It is suspected that these cold-water temperatures may be limiting the abundance and distribution of fish in these stream systems. Additional data is needed to thoroughly assess the situation. A summary of baseline stream temperature data collected during 2003 is located in Figure 6. Trout and/or mottled sculpin were observed or sampled at all sites except for the Upper Devil's Hole Creek and Middle Indian Creek sites.

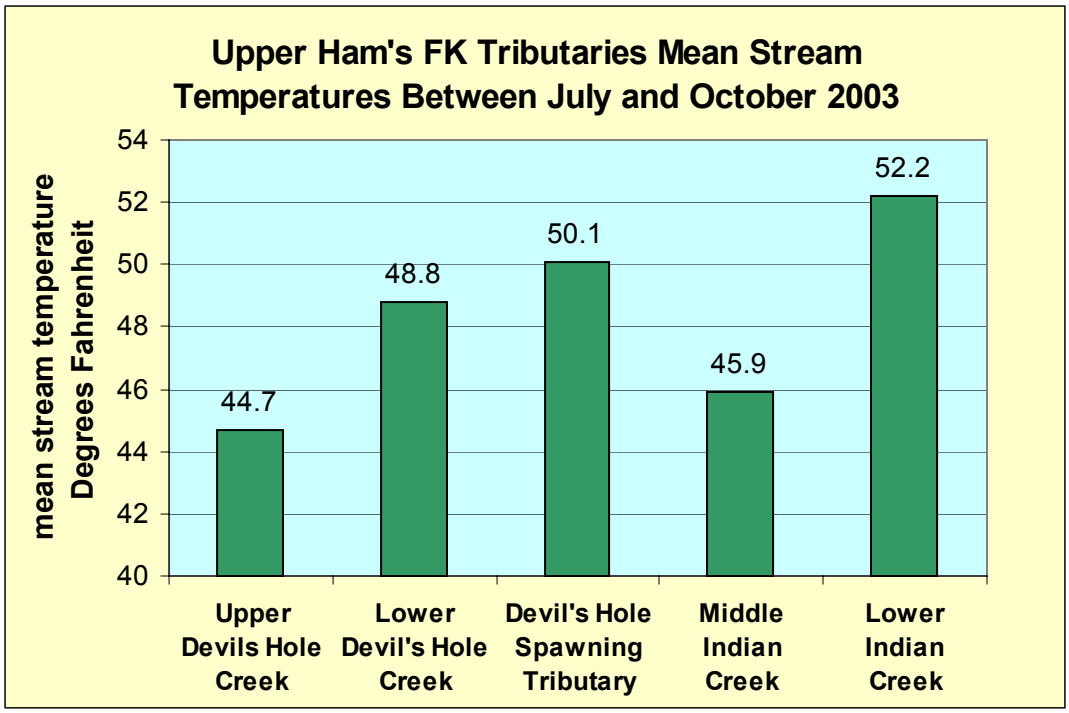


Figure 6. Baseline mean summer water temperatures collected from select tributary stream reaches in the Upper Ham's Fork River Watershed.

Big Sandy River Willow Trend Monitoring

Willow community trend surveys were completed at the five Big Sandy Working Group (BSWG) riparian monitoring sites during October. The data was submitted to the BSWG monitoring sub-committee for their review. Although willows exhibited good growth and vigor inside fenced exclosures at most of the monitoring sites (Figure 7), browsing of willows remained high during 2003 outside of the fenced exclosures. Average willow

✓ Completed willow community trend surveys at five sites along the Lower Big Sandy River.

heights decreased in areas outside of the exclosures at most of the monitoring sites compared to 2002. The decrease in mean willow heights is attributed to a combination of environmental stresses which include: the lack of consistently elevated water tables and sound riparian function, drought influences on a drying and dysfunctional riparian zone, increased soil alkalinity from a drying riparian area, and excessive livestock browsing and/or trampling. The combination of these factors has reduced willow vigor resulting in dieback of stems on individual willow plants, or entire willow plant mortality. Willow stem dieback between 2002 and 2003 is the apparent cause of the reduced trend in average willow heights.

Figure 7. Willow growth and vigor exhibited inside the fenced exclosure at the BSWG #2 riparian trend-monitoring site located on the Lower Big Sandy River during October.

✓ Completed a survey of active beaver dams in Upper Tout Creek to assess watershed restoration response.

Trout Creek Watershed Restoration Monitoring

A beaver dam trend survey was conducted in the upper drainage between the headwater springs area and the Ramsey Ranch during October. Trends in the number of active beaver dams in upper Trout Creek are being used to evaluate the ecological response to watershed restoration activities. Data collected from the 2003 survey is not representative of expected beaver dam activity in the upper watershed. Trout Creek experienced a catastrophic-scaled geomorphic event during late July that either breached or removed every beaver dam in the survey area from the headwaters spring in the East Fork Trout Creek downstream to the Ramsey Ranch. During July, a heavy, slow moving, localized rainstorm occurred over Little Mountain creating excessive overland flow on the 2002 Pepper Wildfire site, which prompted destabilization and mass downstream movement of soil and rock material. This event altered the stream channel configuration throughout the entire system, and either buried beaver dam materials under gravel and cobble or displaced the dam materials out of the riparian area onto adjacent terraces (Figure 8). As a result, 87% of the beaver dams

surveyed where located in the West Fork of Trout Creek, which was not effected by the geomorphic event. Moreover, 100% of the active beaver dams surveyed were found in the West Fork.

Figure 8. A severe July rainstorm in the Upper Trout Creek caused stream channel entrenchment, redistribution and deposition of streambed gravels, and breaching and displacement of wood from beaver dams.

✓ Completed riparian greenline vegetation trend monitoring at two sites in Upper Currant Creek.

Upper Currant Creek Riparian Greenline Monitoring

Two permanent riparian greenline vegetation-monitoring stations were surveyed in Upper Currant Creek at stream elevations of 7490 ft. and 7640 ft. The Upper Currant Creek Watershed between the headwaters and Jane's Meadow remains the stronghold habitat in the drainage for Colorado River cutthroat trout (CRC). Vegetative monitoring results in Figure 9 suggest a slight improvement in vegetative trend, however streambank vegetation has not improved to a riparian species dominated community necessary to maintain stability in the upper drainage.

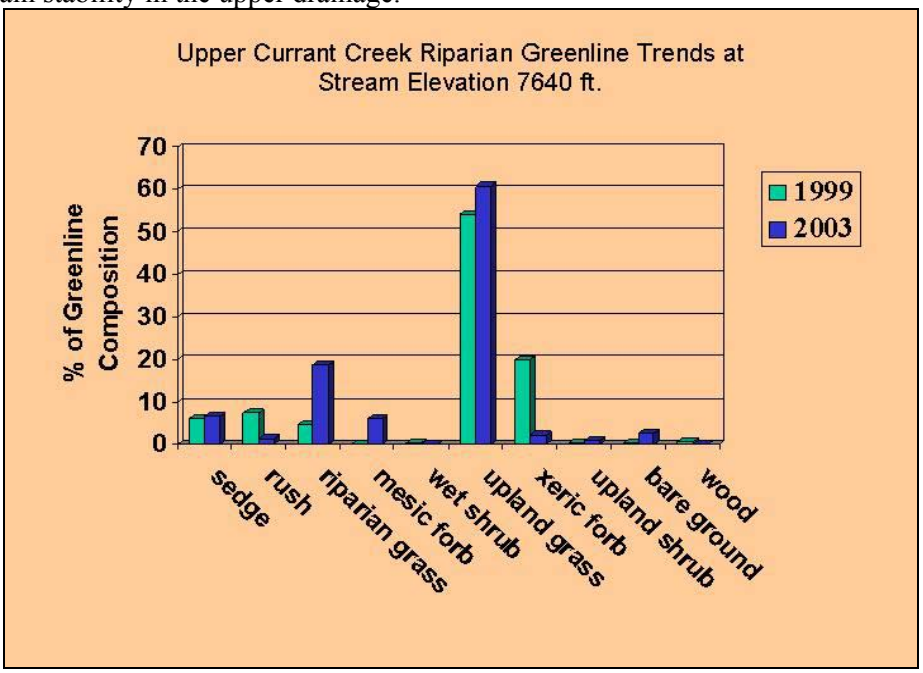


Figure 9. Streambank vegetation composition comparisons between 1999 and 2003 at the 7640 ft. elevation survey station in the Upper Currant Creek showing continued domination of the plant community by upland grasses.

Photo point comparisons in Figure 10 also indicate streambanks are not functioning to absorb and store water, and the vegetative community composition is still influenced by precipitation events rather than elevated water tables. Present conditions in the Upper Currant Creek Watershed warrant concern due to the slow rate of riparian system restoration and ongoing vulnerability to degradation, even following eight consecutive years of livestock grazing deferment. This concern was recently conveyed to the Rock Springs BLM Field Office, and Department representatives suggested continued livestock deferment in this portion of the Currant Creek Watershed until riparian vegetation has recovered enough to provide adequate streambank stability to at least meet the minimum habitat needs for maintaining a viable CRC population.

Figure 10. Photo point comparisons of streambank vegetation along Upper Currant Creek at stream elevation of 7640 ft between 1997 and 2003. Note the dry appearance of plants located only a few feet away from the left stream edge in the 2003 photo, which suggests riparian area dysfunction resulting in lack of water absorption and storage.

Thoman Ranch Lease and Continuous CRP Riparian Habitat Improvement Project

The Wyoming Game & Fish Dept. purchased a 10-year lease of 429.5 acres or irrigated pasture, irrigated hayland and rangeland for wildlife grazing with a first option to purchase the ranch should they decide to sell during the lease period. This is a 10-year lease with the option to renew for another 10 years at our discretion. Access Yes funds were used to purchase the lease in the amount of $7,000.00/year with an additional $2,500.00 being paid the first year to install deer proof fencing around the house and outbuildings. The Thoman property is within a critical migration corridor for the Wyoming Range mule deer herd. In addition, elk, mule deer, and moose winter on the property and adjacent lands. In the past, damage claims have been prominent and many hours have been spent by department personnel trying to discourage mule deer and elk use during the winter. The purchase of this lease will help to alleviate this ongoing problem.

Funding was also received from the WGFD for a Continuous CRP Riparian Habitat Improvement project in the amount of $5,761.83 to construct fencing to exclude livestock use of riparian areas. This habitat project will enhance woody vegetation within the riparian buffers and leave it available for wildlife use. It will also allow for the development of the flood plain and a meandering stream flow pattern. These enhancements will benefit mule deer, elk, moose, beaver, waterbirds, passerines, Bonneville cutthroat trout, and leatherside chubs.

The Thoman property has also entered into a 10-year Continuous CRP lease in which they receive an annual payment from NRCS in the amount of $2027.00.

- ✓ Access Yes funds were used to purchase a 10-year lease in the amount of $7,000/year.
- ✓ An additional $2,500 was paid the first year to install deer proof fencing around the house.
- ✓ Riparian Habitat Improvement grant funds in the amount of $5,761.83 were used to construct a fence to exclude livestock use.
- ✓ $2,027 was received from NRCS for a 10-year Continuous CRP lease.

Wildlife Habitat Management Areas

Red Rim/Grizzly WHMA Grazing Management

The lessee grazed approximately 1,750 head of yearling cattle on the Red Rim WHMA between May 5th and June 4th 2003. The yearling herd was then trucked to the Grizzly WHMA where they grazed through the pasture rotation until the first week in September when the herd was gathered and shipped. Management strategies for the Upper and Lower Muddy Creek Riparian Pastures limited grazing to 5 days of trailing use in each pasture, in a continuing effort to restore vigor of woody riparian vegetation where potential exists along this reach of Muddy Creek. The lessee elected not to make use of his 2003 fall season grazing privileges at the Red Rim WHMA.

Department representatives met with the owner of Stratton Sheep Company again in late August to discuss possible trades involving exchange of grazing use on the Grizzly WHMA as a solution to avoid grazing cattle in common with the Department's grazing lessee. Again, neither party could come to an agreement on an equitable solution, so the situation remains at a stalemate.

Stratton Sheep Company was again granted a temporary class of livestock conversion to graze cattle on the Grizzly WHMA by the BLM during the 2003 season. The temporary conversion was allowed on a trial basis during 2002 to evaluate grazing results for consideration of a permanent conversion. Stratton Sheep Company utilized the Shipping and West Rendle Pastures early in the summer of 2003 prior to the Department lessee, and was suppose to leave adequate forage production for both our lessee's yearling cattle to use and for plant community maintenance. This management strategy did not work as

well as it did during 2002, and ocular estimates suggested that many areas in both the Shipping and West Rendle Pastures received excessive grazing use by Stratton Sheep Company's cattle prior to the Department lessee's scheduled grazing use.

Miscellaneous

- ✓ Attended an introductory ArcGIS offered by the Wyoming Geographic Information Science Center at the University of Wyoming.
- ✓ Attended a short-course overview of Wyoming Water Law held in conjunction with the Fish Division Meeting in Thermopolis.
- ✓ Provided a site visit and technical assistance to a Farson landowner to develop a reservoir to serve as a combined fishpond and wetland.
- ✓ Conducted a site visit and recommendations for enhancing an existing wetland on private lands along the Black's Fork River near Fort Bridger.
- ✓ Met with the Ashley National Forest to discuss management options to address sagebrush die-offs at specific sites on the Flaming Gorge NRA.
- ✓ Participated as an aquatic habitat representative at meetings and provided written comments for the Department sage grouse management plan.
- ✓ Participated along with other Aquatic Habitat Biologists on a site visit to the tail-waters area of the High Savery Dam site to provide stream habitat improvement recommendations to the WWDC and consulting project engineer.
- ✓ Provided a vegetation ecology field trip to the Little Mountain area for a group of Green River High School biology students.
- ✓ Assisted in providing comments to consultants representing the City of Green River regarding planning for a river corridor recreation plan and white water park expansion project.

✓ Developed proposal to begin habitat evaluation and inventory.

✓ Received $79,125 in funding from USFWS Sagebrush/Shrub-Steppe Ecosystems Grant program.

✓ Initial classification to be completed by March 31, 2004.

✓ Final classification to be completed in approximately 850,000 acre priority areas.

JACKSON REGION

HABITAT PROJECTS

Brucellosis-Feedground-Habitat Program

The coordinated work schedules of habitat and brucellosis biologists continue to dovetail very well in the Region. Doug Woody filled the Jackson Brucellosis-Feedground-Habitat (BFH) position in the spring of 2002, but vacated it in early 2003. Jill Miller was selected during the summer of 2003 to fill the position. Frequent and continued turnover in BFH positions continues to affect project efficiency and consistency. In 2003, BFH program personnel worked with the Terrestrial Habitat Section to improve elk spring, winter, and fall-transitional ranges with habitat enhancement projects. Such projects involved inventory, project proposals, implementation, and follow-up monitoring. Projects are conducted through partnerships with The Rocky Mountain Elk Foundation, Grand Teton National Park (GTNP), and the Bridger-Teton National Forest (BTNF). Vegetation monitoring projects included shrub utilization by elk, aspen browsing transects, and winter range forage production. Elk distribution monitoring included a Rocky Mountain Elk Foundation sponsored grant, which allowed for radio tracking and habitat selection of 20 elk from the Gros Ventre drainage.

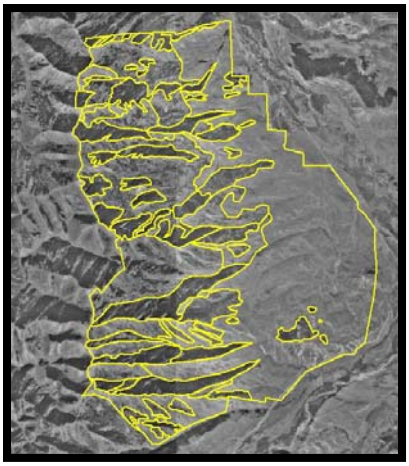
Gros Ventre Elk Radio Telemetry and Habitat Selection

Radio collared cow in Gros Ventre.

Twenty elk were fitted with radio collars in the Gros Ventre drainage during the winter of 2001-2002 to determine seasonal distributions, habitat selection and migration routs. Numerous habitat enhancement projects have been implemented historically within the drainage. An additional five elk were radio collared in March 2003 to replace five elk removed/lost from the previous year. Several elk moved into the Green River and Wind River drainages during the summer. One elk spent the summer and winter adjacent to Dubois. None of the elk moved to the Teton Wilderness or Yellowstone National Park. Six of the 20 collared elk summered outside of the Jackson herd unit. The project will be continued for an additional year to evaluate use of habitat treatments on late fall, winter, and spring ranges.

Monument Ridge Rx Burn

The BTNF has proposed a prescribed burn for about 8,000 acres of sagebrush/grassland, mountain shrub, and aspen-conifer mix in the Monument Ridge area located about 25 miles southeast of Jackson. This area is elk and moose winter and transitional range. Also, several thousand mule deer use this area as transitional range during spring and fall migrations. We have habitat typed the entire area using aerial photos and field verification, and developed a GIS layer of this information. We are working on objectives for each habitat type and hope to finalize

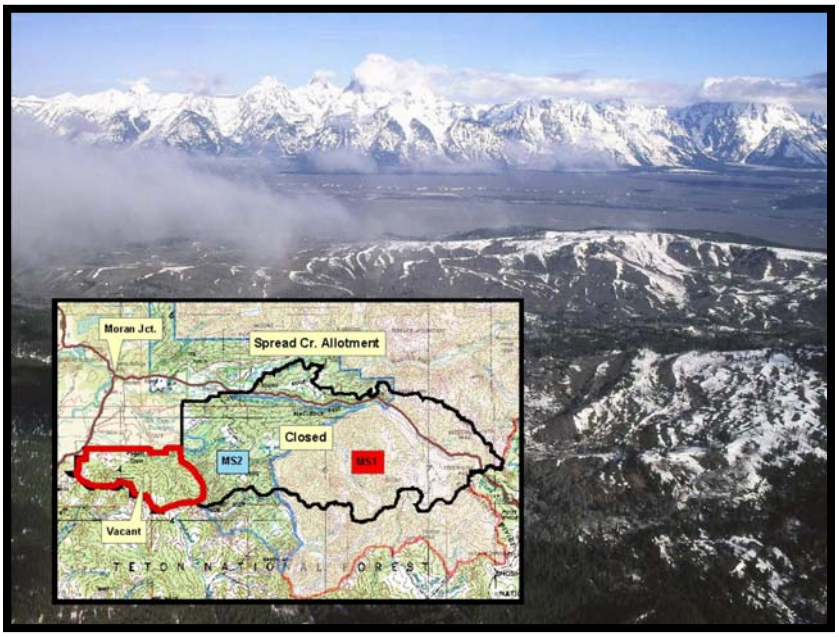


Monument Ridge habitat types.

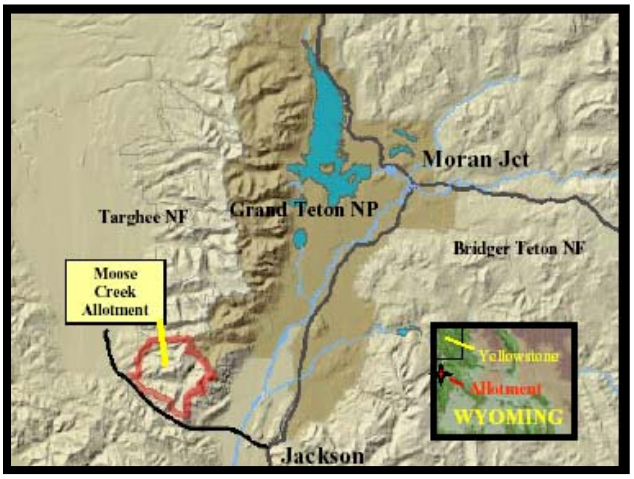
these objectives with Bridger Teton National Forest in the spring of 2004.

Blackrock/Spread Creek Allotment Closure

The Blackrock/Spread Creek allotment (87,500 acres), located southwest of Moran Junction ,was closed by B-T Forest Supervisor Kniffy Hamilton on August 1, 2003. The allotment had been grazed for over 40 years by the Walton Ranch. WGFD habitat personnel assisted in finding a workable solution to the wildlife/livestock conflicts that were prevalent on the allotment since the early 1990s. Personnel had documented 108 bear killed and wounded cattle on the allotment from 1992-1998, costing the WGFD approximately $158,000. Increased bison use also presented a significant risk of disease transmission (brucellosis) to cattle. The allotment also provides year-long as well as winter range for 800-900 elk. It's also a key migration route for elk in the Teton Wilderness and Yellowstone National Park. Threatened and Endangered species using the allotment include Canada lynx, grizzly bear, gray wolf and bald eagle. Numerous sensitive species also inhabit the area.



An incentive payment was provided to the Walton Ranch to retire their grazing privileges. Next, the Walton Ranch waived their grazing permit back to the Forest Service without preference. Major partners on the project include the RMEF, the Heritage Foundation of Wyoming, the Charles Engelhard Foundation, Vital Ground, the Cougar Fund, the Greater Yellowstone Coalition, the Wiancko Family Fund, and the Arthur B. Schultz Foundation. Numerous other individuals, foundations, and conservation organizations made this retirement possible.



Moose Creek Allotment Retirement.

WGFD habitat personnel assisted with negotiations for closure of the Moose Creek allotment during the fall of 2003. The Moose Creek sheep allotment (25,000 acres) is located on the western slope of the Grand Tetons, 15miles west of Jackson, Wyoming, and directly east of Victor, Idaho. Moose Creek is on the Caribou-Targhee National Forest and most of the allotment is within the borders of the Jedediah Smith Wilderness Area.
The Moose Creek drainage provides outstanding bighorn sheep habitat. Diseases carried by domestic sheep have long decimated wild sheep populations and continued sheep grazing on the allotment poses a significant on-going threat to resident wild sheep populations. Retirement of the Moose Creek allotment will directly benefit bighorn sheep populations throughout the entire Teton mountain range. The lower portion of Moose Creek provides important winter range for elk, moose, and mule deer, while the upper portion provides significant wintering habitat for bighorn sheep. In addition to ungulate winter range, a recent radio tracking study has documented high wolverine use of the Moose Creek drainage during the winter months when these solitary animals feed on winter-killed elk and deer. The Moose Creek area also supports some of the highest densities of moose in the state.

Jackson Interagency Habitat Initiative

The Jackson Hole Interagency Habitat Initiative (JIHI), is a collaboration of biologists from the US Fish and Wildlife Service, WGFD., BTNF and Grand Teton National Park (GTNP). The goal of JIHI is to maximize effectiveness of native winter range for ungulates and a diversity of wildlife indigenous to this region through identification of habitat management opportunities. Emphasis will be placed on enhancing distributions of elk on winter and transitional ranges. The emphasis on elk distribution stems from their current concentrations on and near feedgrounds and disease issues related to these concentrations.

✓ Jackson Interagency Habitat Initiative group identifies goals and objectives.

The JIHI area of concern is the Upper Snake River Basin in northwestern Wyoming from the town of Jackson north and within the herd unit boundaries of the Jackson elk herd, as identified by the WGFD. The Upper Snake River Basin includes the headwaters of the Snake River, the Buffalo Fork, Pacific Creek, Spread Creek, Gros Ventre River and Flat Creek drainages.

JIHI objectives are:

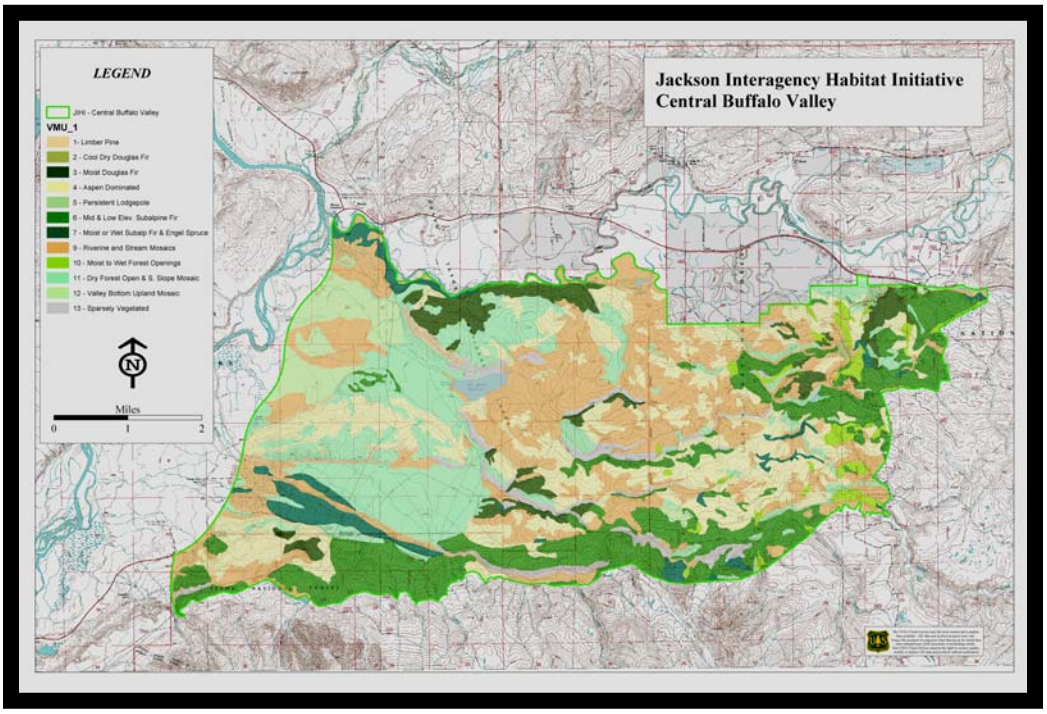
1. Create a common Geographical Information System (GIS) database of the following information
- Known ungulate distributions during winter (December through April)
- Potential additional winter range based upon physiographic features of the landscape and snow water equivalents
- Plant communities on these ranges
- Distributions and dates of past fires and other habitat treatments within these ranges and current status of the plant communities treated
- Ungulate feeding operations, both wild and domestic
- Summer and winter travel plan restrictions
- Noxious weed distributions

2. Identify and map areas of opportunity for ungulate winter and transitional ranges through vegetation manipulation.
3. Identify competing land uses that limit habitat effectiveness for wildlife
4. Prioritize these areas based upon their relevance to: achieving ungulate population objectives, reduction of disease prevalence and risk among ungulates, attainment of

resource management agency missions and goals, maintenance of biodiversity, and recognition of various resource management, policy, and public safety constraints.

5. Identify protocols and methods for pre- and post-treatment monitoring of habitat enhancement projects to measure response of both plant communities and wildlife species.
6. Develop a protocol for continuing coordination among the state and federal agencies for evaluating achievement of the above stated goal and reporting progress to agency administrators.

Agency administrators from GTNP, USFWS, USDA Animal and Plant Health Inspection Service, and the WGFD collectively encourage the BTNF to pursue habitat enhancements via a memo in October, 2003. Personnel and financial assistance was offered by the above agencies.



JIHI's initial project area, SE of Moran Jct.

✓ JIHI initial project area is Buffalo Valley.

Since that time, agency biologists have used available resource information to identify three primary focus areas; upper Gros Ventre, lower Gros Ventre, and Buffalo Valley. The focus area within Buffalo Valley has been habitat typed and vegetation treatment objectives identified. Tentative plans are to initiate prescribed burns during the fall of 2004.

✓ Inventoried 41 miles of streams and 10 miles of the Salt River Corridor.

Lower Salt River Watershed Habitat Assessment

The Salt River Corridor was identified as higher ranked priority watershed in the Jackson Region. Therefore, steps were taken to meet the objective to inventory and evaluate wildlife habitat using an integrated watershed or landscape approach.

The Salt River is made up of three watersheds: Upper, Middle and Lower Salt River. This year, inventories focused on Limekiln, Aspen and Willow Creek subwatersheds. Forty-one miles of perennial and ephemeral streams and five miles of river were assessed using the

✓ Completed WHAM Level 1 evaluation on ten streams.

Level 1 Watershed Habitat Assessment Method. Level 1 is an inventory of existing habitat condition, current habitat degradation is noted and management recommendations are made. Also, toured the Salt River and the tributaries habitat with the Statewide Fish Population Crew. The Comprehensive Study of the Salt River Fishery Between Afton and Palisade Reservoir from 1995-1999 with Historical review; Fur Trade-1998 was reviewed and used as a guide for the tour. Changes in channel form, past habitat work and possible future habitat projects were noted.

✓ Participated in Salt River CRM and Watershed Planning Committee.

In addition, personnel met with a dozen different landowners, property and land mangers to find future projects that preserve or restore habitat at the watershed/landscape level. Due to the amount of private land, habitat improvement projects required a high level of coordination and collaboration in order to satisfy the needs of all the resource users.

Snake River Spring Creeks Enhancement Project

The Snake River fishery is maintained by recruitment of fish from the spring creeks. These tributaries contain the majority of spawning areas for native Snake River Cutthroat trout. River and land management practices, have changed the structure and function of these important instream habitats. Currently, these spring creeks have widened, inundated with silt and aquatic vegetation and stream velocities have decreased. In addition, the vegetation communities have succeeded from willow and cottonwood riparian vegetation to Douglas fir and other conifers. The largest contributing factor to the degradation is the lack of flushing flows from the Snake River. Since the river has been levied to resist flooding of private property, flushing flows are not possible. Spawning habitat for native and sport fish has and will decrease. Therefore, the spring creeks of the Snake River are the second priority for the aquatic habitat projects in the Jackson Region.

✓ Contacted 13 landowners, property mangers and consulting firms associated with various spring creeks.

A cooperative effort with fisheries and wildlife managers, private landowners, Wyoming Wildlife Heritage Foundation, Teton County NRCS, GTNP, conservation groups and other agencies has been initiated. The objectives are to enhance aquatic and riparian habitats to maximum ecological potential, provide sufficient habitat and habitat diversity to increase Snake River cutthroat trout populations and supply a quality fishery for anglers on the Snake River. Dredging of spring creeks and modifying channels, irrigation and grazing will be the tools employed for these projects

✓ Submitted State Grant and Teton Conservation District proposals for spawning and migration habitat improvement.

Three different spring creeks were explored for possible enhancement opportunities. Blue Crane Creek was identified to provide valuable habitat for Snake River Cutthroat trout. Blue Crane LLC, Ford Ranch and 3 Creek landowners and property mangers were contacted in order to gain access to the properties of interest. The headwaters of Blue Crane Creek were chosen because of the potential for spawning and juvenile habitat. The stream has a historical grade structure; this grade control has made the stream wide with low water velocity. Removal of the structure could increase Snake River Cutthroat trout migration and spawning habitat and enhance stream function.

Headwaters of Blue Crane Creek.

✓ Installed temperature logger and stream gage to develop a temperature and flow history.

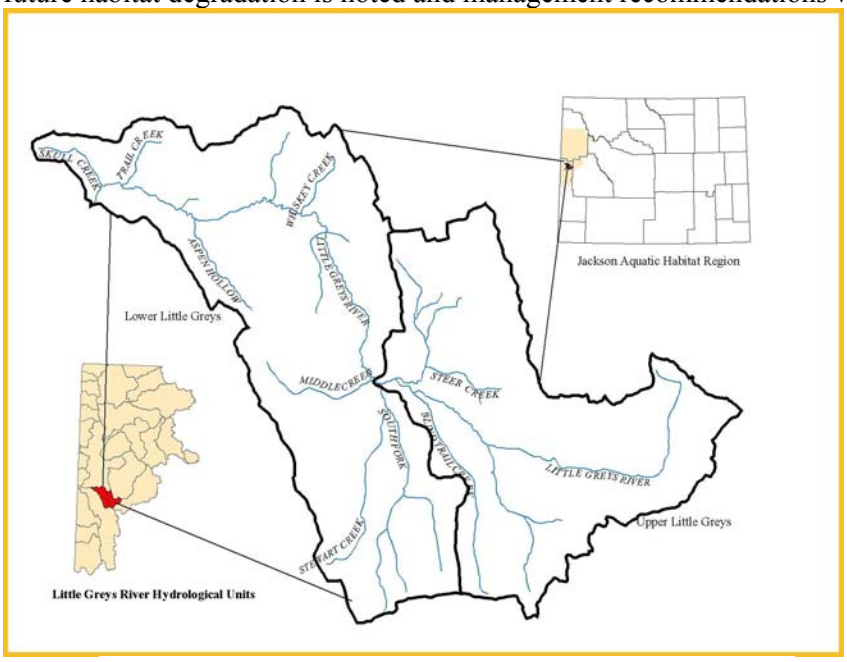
✓ Profile and cross-section surveys established for first ¼ mile of Blue Crane.

A plan for a two-phased project was developed. The objectives for the first phase of the project were to remove the sediment from the headwaters of Blue Crane and provide quality pool and riffle habitat. These habitat features had become inundated with silt and aquatic vegetation. During the planning process the landowners decided they wanted to improve the aesthetics of the stream. Therefore, they hired a consultant to design a project that met the needs of the project and their visual needs. Work is planned for the second week of January of 2004.

Little Greys River Watershed Assessment

Inventoried 62 miles of stream for the Little Greys River Watershed Assessment Survey. Results are discussed in the Little Greys Watershed Habitat Assessment (WHAM) – Level 1. Level 1 is an inventory of existing habitat and habitat conditions. Current and possible future habitat degradation is noted and management recommendations were made.

✓ Inventoried 62 miles of stream for the Little Greys River Watershed Assessment.



Little Greys River Watershed Habitat Assessment area.

✓ Completed WHAM Level 1 evaluation on seventeen streams and one river.

The Little Greys River is made up of two subwatersheds and seventeen perennial streams. The geologic characteristics of the overthrust belt dominate the structure of the river, streams, riparian areas and upland habitats. The headwaters of the streams are flow limited to native fish. The majority of the streams are narrow, deep, with little meander and cobble substrate. The bulk of the riparian areas are also narrow and dominated by willow communities. Upland habitats are made up of a conifer mix on northern slopes and sagebrush and aspen on the south facing slopes.

Management Recommendations**:**

- Continue cooperation with the Bridger Teton National Forest. For example, participate in the Landscape Scale Assessment, which drafted several projects affecting watershed stability for the Little Greys River.

- Improved road management is vital to the health of the subwatersheds. Modifications are needed so the river and the riparian area are able to function together during high runoff. The tributaries need to be reconnected with the river to provide habitat diversity for native and sport fish.

- Recruitment of LWD, for more pool habitat, is needed in the Little Greys River. Structures have been placed in the river in the past. Continue to monitor and evaluate these structures and the habitat associated with them.

- A program is needed to incorporate fire into vegetation management in the Little Greys River watershed. Aspen clones, conifer stands, and sagebrush communities have become monotypic and decadent, especially in the uplands. Such vegetation defects can be corrected using fire as a tool to improve watershed health. When properly managed, both prescribe burns and naturally occurring wildfires can benefit vegetation in the basin and replace expensive human suppression of wildfires.

- Grazing management needs to focus on vegetation and soil responses both in the uplands and riparian areas. Sheep and cattle need to be moved based on the condition of the forage. Some historically over used areas need to be identified and managed for stability and health.

- Riparian communities need to be managed by the condition of willow communities. Cattle and wildlife numbers should be based on the level of willow use.

- Beaver populations and habitat should be monitored. The Little Greys River basin is within Trapping Area 1 and there is no quota on the number of beaver that can be harvested during trapping season. Investigating the trapping pressure would be an appropriate action.

- Trail and campsite management and enforcement is needed in the Little Greys River watershed. The Bridger Teton National Forest is under staffed for enforcement personnel; thus, violations of the USFS travel and recreation policy in the basin are common.

WILDLIFE HABITAT MANAGEMENT AREAS

Greys River WHMA/Alpine Feedground Elk Jump Project

Historically, elk migrating to the Department's feedground south of Alpine would cross US Highway 89 close to town and travel around the end of the elk fence. Due to "urban sprawl" the old routes are now part of Alpine subdivisions. Elk were forced west into the Alpine Wetland Complex then would try to cross the highway directly to the feedground. Game Wardens tried to monitor elk movements and open the gate to allow elk to the feedground but heavy traffic hindered much of the attempts. Luckily there were no serious accidents but there were several close calls. The Pinedale Habitat and Access Maintenance crew removed 180 feet of elk fence from along the highway and constructed two elk fence "wings" to funnel elk to a 32-foot wide jump. The 7-foot high jump allows elk to move across and off the highway to the feedground but is a deterrent to elk that may want to stray back toward traffic. Two 16-foot metal gates were hung in the opening over the jump to further deter elk straying in the winter after the migration is completed. The gates will also prevent the public from driving off the jump during the remainder of the year. Several hundred elk were documented using the jump during the 2003 fall migration.

Pinedale Habitat and Access Maintenance crew installing cable and post anchors that keep the seven-foot walls from collapsing into the jump.

Department crew completes one of the elk fence wings that now direct migrating elk over the jump to escape traffic on US Highway 89 to the safety of the Alpine Feedground.

National Elk Refuge – Brucellosis Vaccination Project

Vaccination on the National Elk Refuge (NER) was initiated for the first time since limited operations were allowed in 1988 and Habitat and Access Maintenance was a major contributor in making this happen. The Pinedale and Statewide crews strategically placed vaccinators within various NER elk herds by maneuvering snow-cats into position where high percentage shots could be achieved to deliver a paintball marker and the strain-19 vaccine. Crews documented daily, weather conditions, animal behavior, and provided equipment evaluations, technical and logistical support to a developing NER elk vaccination program.

Pinedale and Statewide crews of the Habitat and Access Maintenance branch assisted Veterinary Services personnel with brucellosis vaccination efforts at the National Elk Refuge near Jackson

- Horse Creek WHMA: The Pinedale Habitat and Access Maintenance crew replaced 135 poles on the upper section boundary fence. Final cleanup and installation of stays on the ¾ mile elk fence construction was completed by contractor Carl Jones and was inspected by the Pinedale crew.
- South Park WHMA: Teton County Weed & Pest was contracted to take care of noxious weeds on the WHMA. Public concerns about perceived weed problems were alleviated through communications with Wildlife Supervisor Bernie Holz.
- Presented aquatic habitat classes for Teton Science School, Afton Rendezvous and Kid's Fishing Day.
- Attended trainings regarding GIS and Wyoming Water Law.
- Participated in workshops concerning sagebrush ecology, riparian restoration and rural water law.

LANDER REGION

LIAISON, COORDINATION, EXTENSION SERVICES AND MISCELLANEOUS

This year two landowners/managers were assisted with wildlife habitat enhancement, development or maintenance projects. These were small pond developments that involved sharing knowledge and literature but no WGFD funds were expended.

Attended annual coordination meetings with USFS, BLM, USFWS, NRCS and The Nature Conservancy. Information was shared concerning upcoming projects, policy changes, hunting and fishing seasons, wildlife populations and habitat needs. Department personnel served on four CRM committees and three technical committees.

Appropriate training sessions were attended by personnel as required to maintain professional proficiency.

HABITAT PROJECTS

Green Mountain Common

The Green Mountain Common Allotment is an area of 517,000 acres located south and east of Atlantic City, Wyoming. There are 19 grazing leases associated with this BLM allotment. Cattle, sheep, elk, pronghorn antelope, mule deer and wild horses use

Weasel Draw – riparian site.

the area seasonally. Sage grouse, raptors, and many other species of small and non-game birds and mammals use the area. Overuse by livestock, drought and other factors have contributed to the degradation of riparian areas and to a lesser degree some of the

- ✓ Forage production down on Wildlife Habitat Management Areas. Percentage of forage utilized is high.
- ✓ Funds from the Foundation North American Wild Sheep and the Governors Big Game License Coalition were used to purchase gated pipe for irrigating bighorn sheep habitat at Whiskey Mountain.
- ✓ Installed six PVC vinyl plastic and six timber pilings in Red Canyon Creek.
- ✓ Conducted a 250-acre controlled burn on Mexican Creek.
- ✓ Conducted Wyoming Habitat Assessment Methodology and Warmwater Stream Assessment in the Badwater Watershed – 8 stream miles for fisheries.

uplands, especially on the higher elevations of Green and Crooks mountains. Implementation of management to resolve these resource issues has been frustrating for the BLM and other members of the Green Mountain Committee. Department personnel will continue to be involved with the Committee and provide input as required.

Mexican Creek

Approximately 250 acres of aspen and sagebrush habitat types were burned in the spring of 2001. Additional treatments were scheduled for the spring of 2002; however, criteria for burning could not be met. Therefore, treatment of the remaining 300 acres is scheduled for spring 2003.

Mexican Creek pre-burn site

Sinks Canyon Burn

For the past four years the U.S. Forest Service has been working with the Department to improve forage conditions for bighorn sheep and mule deer in Sinks Canyon. Approximately 1,200 total acres have been burned to date. The burns were all conducted in the months of January, February or March annually. One of the goals of burning was to improve bitterbrush stands. This goal has been successful as the cool spring burns have stimulated new growth. Burning has temporarily been placed on hold because an increase in cheatgrass has been documented in the more recent burns. There is a concern that additional burning may encourage further spread of this plant.

January burn on USFS land

This is the first year that the spread of cheatgrass has appeared to be significant. Mr. Jack Skates, a retired UW professor, has installed transects and is monitoring the area.

Table Mountain Mule Deer Project

Table Mountain is about 12 miles southeast of Lander. It encompasses 30,000 plus acres of crucial mule deer winter range. This area typically winters 600 to 800 animals; however, past data shows as many as 1,200 deer depending on the severity of the winter weather. The key shrub is antelope bitterbrush intermixed with big sagebrush. Skunkbush sumac, chokecherry, serviceberry, and willow are present. Mule deer winter range is gradually being fragmented by housing developments. Time will be spent next year working with the BLM and private landowners to initiate management that will enhance the shrub community. The potential for conservation easements on private lands will be explored. The work on Table Mountain will be expanded next year to include the entire South Wind River Deer herd unit.

Herbaceous Forage Production/utilization

The State of Wyoming has been in the clutches of an ongoing drought for the past number of years. The drought situation has dramatically impacted herbaceous forage production, which also impacts the well being of many wildlife species. Of particular concern are the Rocky Mountain bighorn sheep on the Whiskey Basin Wildlife Habitat Management Area (WHMA). Low forage production, combined with the high percentage of utilization on the plants, is having an impact on the sheep population. Of special concern is the overall health of the animals and the low lamb to ewe ratios. Elk winter range on the Inberg/Roy and Spence/Moriarity WHMAs is also experiencing reduced herbaceous forage production and high use on the plants. The Red Canyon WHMA received higher levels of moisture and the production of herbaceous forage was at or above normal for the area. The following tables reflect the production/utilization figures for this fiscal year.

Inberg/Roy

Transect	Lbs. Production	Lbs. Utilization	Percent Utilization
Alkali Creek	132	98	74
Upper Spring Mtn.	116	84	72
Lower Spring Mtn.	84	62	74
Shippen Flat	36	28	78
Dennison Mtn.	124	100	81
Dennison Cabin	84	68	81
Black Mtn.	165	132	80
Elk Trap Bench	172	140	81
Horse Draw	Unable to clip due to snow conditions.		
Lake Draw	148	124	84
Meadow Bench	180	150	83

Spence/Moriarity (first year for data)

Transect	Lbs. Production	Lbs. Utilization	Percent Utilization
Bad Lands	180	114	63
Peace Flat	104	66	63
Peace Draw	116	70	60
Cabin Spring	188	152	81
Table Mtn.	132	96	73
Windrowed Flat	132	98	74
Coyote Draw	116	90	77

Red Canyon

Transect	Lbs. Production	Lbs. Utilization	Percent Utilization
1	428	336	79
2	400	296	74
3	484	360	74
4	424	292	67
5	792	476	60

Whiskey Basin

Transect	Lbs. Production	Lbs. Utilization	Percent Utilization
Torrey Rim West	188	160	85
Torrey Rim East	248	174	70
Middle Ridge		Not clipped	
Trap Site		Not clipped	
BLM West	76	48	63
BLM East	208	139	67
Sheep Ridge West	180	157	87
Sheep Ridge East	170	102	60
Little Red Creek		Not clipped	
Red Creek		Not clipped	
Meadow Bench	180	150	83

AQUATIC HABITAT PROJECTS

Red Canyon Creek Riparian Improvement Project

This project is on the Red Canyon WHMA located 15 miles southwest of Lander. The Red Canyon Creek WHMA was burnt July 2000 from a wild land fire. The upper part of this watershed was burnt by the lightning-caused Pass Creek Fire in August 2002. After the 2002 fire, the riparian area along Red Canyon Creek had not fully recovered from the 2000 fire and would be impacted by increased runoff and sediment from the 2002 fire. Red Canyon Creek had already down cut due to increased flow in the creek from diverted irrigation water from Beaver Creek before the fires, and was in a deteriorated state. Twelve grade control structures were place in Red Canyon Creek to prevent further down cutting. These grade controls were placed to raise the water table in the riparian area and to collect sediment. Two techniques were used for the grade controls to compare effectiveness and cost. The six classic K-dam structures using 12"X 12" timbers were used with an average cost of $1,500 each. Six PVC vinyl sheet pilings were used with an average cost of $3,700 each. The vinyl sheet pilings were driven in six feet to capture the subsurface flow using a vibrating compactor attached to a backhoe. After pictures were taken each month for better comparison in the future, on the effectiveness of each technique.

Installing PVC vinyl sheeting piling.

Completed PVC vinyl sheet piling.

WILDLIFE HABITAT MANAGEMENT AREAS

Spence/Moriarity

As with past years, cattle trespass has been an issue. To help resolve this, new fence was built from the southeast corner of the Bear Creek Ranch to the southern border of the area. New fence was also built by contract along the river side of Long Meadow. Routine maintenance on other fences was also done and some old unused fences were removed to prevent wildlife accidents.

Horse trespass on the Garrison Meadow on Spence/Moriarity WHMA.

fence was also built by contract along the river side of Long Meadow. Mountain Meadow fence continued to be constructed by a contractor and a fence on the east side of the East Fork River on the backside of Thunderhead Ranch was staked. Routine maintenance on other fences was also done and some old unused fences were removed to prevent wildlife accidents.

The farming/haying lease of the lower Spence/Moriarity meadows (Garrison, Bain, Pease, 21 and Long) was awarded to a local operator. The upper meadows (Sideroll, Firehouse, Thunderhead, Bear Creek and Pea Patch) were irrigated by Department personnel. Irrigation of the upper meadows was shut down in early August to maintain flows in Bear Creek. The Bear Creek meadow was cut this year to stimulate regrowth, remove old growth, and litter accumulation. This will help make the forage more palatable to wildlife. This is according to last years plan to cut one of the meadows on Bear Creek on a four year rotation. The Dubois satellite position is helping tremendously with the trespass situation as well as with fence maintenance. Pipelines and irrigation systems were maintained and repaired as needed.

Assistance was provided the terrestrial habitat biologist with forage production clipping on the upland areas.

Inberg/Roy

Department personnel irrigated 195 acres of former farm fields, which are left standing as winter forage for elk primarily, although they benefit deer and moose as well. Irrigation was shut down in August.

The Elk Trap Diversion was maintained and repaired as needed. The cleaning of the Elk Trap ditch has been contracted.

Whiskey Basin

Irrigation was a top priority in 2003. The systems were maintained, and both Trail Lake meadow and Whiskey Basin meadow were irrigated. The Whiskey Basin meadow was irrigated by CM Ranch as part of the grazing exchange agreement on BLM Ridge. This agreement was changed to having the Game and Fish irrigate the meadow next year. Natural Resources Conservation Service (NRCS) was contacted to discuss upgrading the Whiskey Basin meadow irrigation delivery system.

Bighorn Sheep on Whiskey Basin WHMA.

Ocean Lake

Due to continued drought conditions, irrigation was a priority. Ditches were cleaned and irrigation began in May on approximately 450 acres of old farm fields, and was done by a summer temporary.

Pond levels were maintained at satisfactory levels; we had another short water year, although better than last year. Water was shut off in mid-September, and the ponds had adequate water levels for waterfowl hunting and winter carryover.

The grazing lessee on the Foster Segment maintained the boundary fence on Ocean Lake as a condition of his lease as well as purchasing $1500 of fence material and delivering it to the Lander construction yard. Last year's lease was extended for another year.

Irrigation on the Lockhart segment of Ocean Lake WHMA.

A second grazing lease began in January 2002 and continued through February 2002 on the Maxon and Abernathy areas. This area consisted of 479 acres of old farm fields and permanent cover/wetland areas, which are irrigated and left for permanent wildlife cover. A total of 264 AUMs were used during the grazing period. The grazing is used as a method of removing old growth and accumulated plant litter that is beginning to suppress annual plant growth. New steel gates were installed on some of the popular pheasant parking areas. Parking areas were mowed before pheasant season opened and gates were locked to prevent unauthorized travel on permanent cover areas.

Sand Mesa

The farm lessee had a relatively good crop year considering the shortage of irrigation water and sprinkler maintenance requirements. Other routine maintenance and repair costs were also incurred for the sprinkler systems.

Red Canyon

The main priority this year was fence maintenance, due to the wildfire, which burned under the fence along the north side. Most of the burned fence has been replaced under contract.

Sheet piling was installed in Red Canyon Creek to create a drop structure for sediment capture and to raise the water table.

The meadows were grazed in May to help relieve pressure on some of the burned area above the WHMA. Fortunately, there was enough water this year so that the Big Horn Basin irrigators (with prior rights) did not put a 'call' on the Wind River system, so there was adequate water to irrigate the meadows. The meadows were also irrigated under contract and plans are being made to break up the sod next year.

We are also working with the State Land Board and The Nature Conservancy (our neighbors to the east and south) through the Lands Branch in Cheyenne to trade some state land between the two of us. This will block up all our land on the south and west side of Highway 28, rather than

having a portion on the north and east side as well. This will work well and will eliminate some fences as well as consolidate all our land.

Mexican Creek

This is a low maintenance area, with major activities being routine fence maintenance, cattleguard cleaning and parking area maintenance.

The entrance road had become difficult to use and was repaired under contract.

Sinks Canyon

State Parks has had a management agreement with the Department for the last several years. A new agreement was formulated and signed, and a new management plan for the WHMA has been initiated. This is a small area (514 acres); as a result, there is not a great deal of management activity on the part of the Department. Most has been proposed and carried out by State Parks as part of their operation. Some habitat treatments have been conducted over the past few years in conjunction with the Forest Service and BLM, but nothing during 2003.

MISCELLANEOUS

- Midvale Irrigation District annual meeting attended.
- Dubois/Crowheart Weed Management Association formed and several meetings attended.
- Terrestrial Habitat Branch & Habitat/Access Maintenance Branch meetings attended.
- Monthly coordination meeting with Statewide Crew and Assistant Branch Supervisor.
- Interviews for irrigators.
- Put up and remove fire ban signs on all WHMAs.
- Helped the Lander Wildlife Management Coordinator open the Dubois check station.
- Put up and remove fire ban signs on all WHMAs.
- Helped the Lander Wildlife Management Coordinator open the Dubois check station.

LARAMIE REGION

HABITAT PROJECTS

Habitat Monitoring Stations

These stations are being used to gather composition, utilization, age class and condition information on pronghorn and mule deer herd crucial winter ranges. Four additional monitoring stations were established during this segment. A total of 49 are now in place throughout the region, with three additional pronghorn stations planned for installation in 2004. All canopy cover and density/recruitment transects were reread in 2003 using improved techniques that will provide more precise measures of canopy cover/species and decadence and dead. The data being accumulated will be used to help guide land and wildlife population management decisions.

The dramatic declines in 2002 shrub production were eclipsed by the recoveries in 2003. Despite the fact that the drought persists, perfectly timed spring and early summer rains resulted in herbaceous and browse forage production that exceeded anything seen in years. Overall shrub production was up an average of 153 per cent over 2002. More detailed analysis and comparison of the various data being collected at monitoring stations will be conducted in 2004.

Although annual production was greatly improved, vigor and condition in many shrub communities has been diminished to varying degrees by long term over utilization and senescence. In most cases, fecal analysis does not show significant competition between the primary big game species on the winter range and other wild or domestic ungulates. The indication, therefore, is that the current population of the objective herd is above the carrying capacity of the range and in some cases has probably been at these inflated levels for some time. The most notable example is the Shirley Basin segment of the Medicine Bow pronghorn herd. In this case production of pronghorn fawns has decreased by 20 /100 in a decade and harvest has decreased by 70% since 1992. There is no indication that the particularly poor condition of the winter range and the subsequent loss of herd productivity is a phenomena of anything other than over use by pronghorn. Treatment of these stands is probably not a viable option. Not only would it be difficult and/or these large shrub communities, but long term success would be unlikely pronghorn numbers were not decreased and utilization remained high. Treatment may also be unnecessary as these plant communities appear to still have recuperative potential if given adequate rest. The recommendation for this and other winter ranges, where over use is effecting plant health, is to reduce herd numbers until forage and fawn production indicate that utilization is once again within some range of carrying capacity.

Southeast Wyoming Wildlife Habitat Partnership

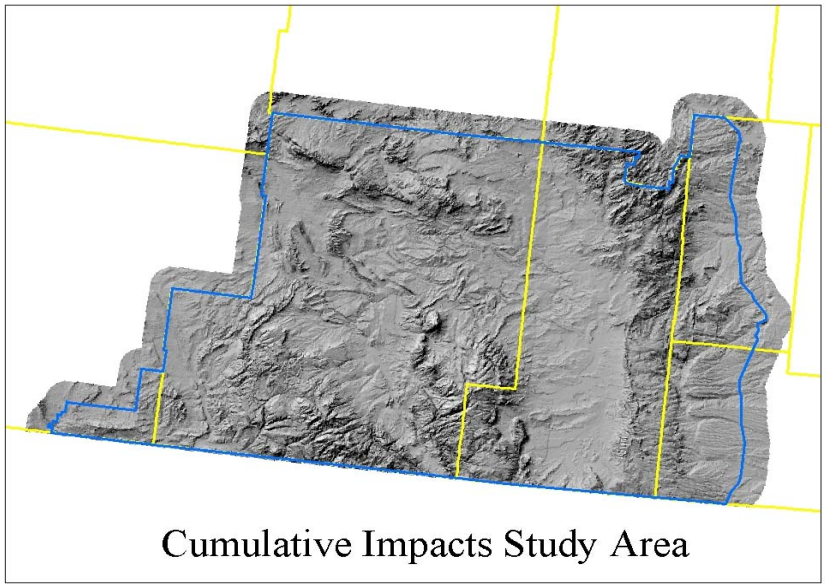
This project has been in the planning stage for six years, held up for the last three by the NEPA process. It was recently determined that the NEPA document is no longer an essential precursor to initiating the project and will be completed while work is in progress. While this project languished in bureaucratic limbo, changes in attitudes and events combined to influence the group to modify the projects original objective of recreating the 30 year fire return interval in the mule deer shrub winter ranges on the Snowy Range. Presently the mission of the Southeast Wyoming Wildlife Habitat Partnership (Partnership), as outlined during the groups inaugural meeting in December of 2003, will be to *use a cooperative interagency approach to identify projects that will address wildlife habitats of greatest need and thereby ensure the most effective and efficient use of agency resources and personnel.* The primary charge of the

- ✓ 4 new monitoring stations established
- ✓ Suggestions for alternate herd management
- ✓ Create inter-agency working groups
- ✓ Administered the development of SE Wy. cumulative impact analysis
- ✓ Began analysis of historic vegetation data
- ✓ Plans for 8,800 acres of prescribed burns
- ✓ Plans for increased area and access – Rawhide WHMA
- ✓ Completed 8 I&E efforts
- ✓ Attended 8 trainings
- ✓ Held membership in 7 intra-department committees or groups
- ✓ Developed 2 WGFD trust fund project proposals

Partnership will be to annually review the various projects being submitted by the experts in each agency and make comments relative to each projects potential benefits and impacts to wildlife. Each project will be ranked and the input from the group passed onto the administration of the agency sponsoring the project. The assumption is that an evaluation based on objective input, using tools such as the following Southeast Wyoming Cumulative Impacts Analysis, will result in a list of high quality projects that will result in maximum benefits for wildlife which will subsequently garner the financial backing that is available to large multi agency groups like the Partnership.

Southeast Wyoming Cumulative Impacts Analysis

This project was initiated in June 2002 and involves developing a GIS based record of the impacts that have occurred in the past 30 years to the major winter range shrub communities of the Laramie Region and the eastern ¼ of the Green River Region. The project is a joint venture, initiated by the Department and supported by the BLM, U.S. Forest Service and the Natural Resources Conservation Service. The project is being contracted through the Wyoming Geographic Information Science Center (WyGISC) and the Wyoming Cooperative Fish and Wildlife Research Unit (Coop). WyGISC will use satellite image interpretation to map major vegetation types and identify areas that have been impacted by natural and man caused disturbances. The Coop is providing a research associate to ground truth vegetation types discovered during the photo interpretation and gather hard copy and digitized impact information from the land management agencies. The GIS product that results from this research will be used by the wildlife and land management agencies as a primary planning tool. in development of projects proposed in the important shrub communities of southeast Wyoming. A small area was added to the southwestern corner of the of the project area in 2003 which required that the completion date be postponed from June 30, 2004 to September 30, 2004. Two meetings were held in 2003 (June and December) to allow cooperators to view progress and discuss the project with the contractors. The project is expected to reach completion as scheduled.



Area of cumulative impacts analysis outlined in blue.

✓ Provided input into 2 major land management agency plan revision processes

✓ Assisted with chronic wasting disease testing

✓ 40 Private landowner extension contacts

✓ Educational outreach efforts to 500 people

✓ 16 guzzlers completed in CRP tracts

✓ WGFD habitat funds matched 4:1 with outside sources

✓ 200 mi^2 of watershed assessments completed

✓ 15,360 acres of watershed assessments completed and beaver dams inventoried

✓ Grazing treatment conducted on Wick WHMA

Analysis of Laramie Region Historic Browse Vegetation Data

This project involves compiling historic vegetation transect data, collected by the WGFD, BLM and USFS, during the 1960s and up through the 1990s, into a data base format that can be compared to data being collect now and in the future. Of primary interest are trends in composition, age and form class and utilization and the implications changes in these factors may have for ungulate management in these areas. The intern hired to conduct the project discovered a variety of inconsistencies in the way the data were collected which has complicated data analysis by making temporal and spatial comparisons difficult and in some cases leading to questions as to the accuracy of the information presented on field data forms. Finding methods to resolve these issues has increased the level of difficulty of the project to the point that the intern has opted to use her research into data analysis techniques as the basis for a masters degree in applied statistics. The project is scheduled for completion by the end of February 2005.

Habitat Extension and Habitat Enhancement

- Prescribed Burns - Burns/Buxton –2,700 acres of true mountain mahogany and mixed mountain shrubs northeast of Laramie were originally planned for burning completion in 2003. Postponed due to funding delays and weather. Reschedule for 2004. Objective – Regenerate over mature winter range shrubs.
- Farm Bill, county wildlife habitat and species priorities identified and plans developed for Platte, Laramie, and Niobrara County.
- Rock Creek and Chugwater Creek (Platte County) – continued habitat assessment within watersheds, project technical assistance and implementation, review of water quality data.
- 40 individual landowner contacts, on-ground technical assistance.
- 30 acres wetlands planned / designed / funding allocated.
- 2,600 acres planned for prescribed fire in mixed mountain shrubs.
- 2,000 acres CRP enhanced through light disking, legume interseeding, and/or prescribed fire.
- Herbicide application to control noxious weeds in habitat project areas on 100 acres.
- 16 guzzlers completed, additional 14 planned for 2004.
- Continued livestock grazing management assistance to producers affecting thousands of upland and riparian acres, including installation of pasture cross fences and water developments.
- Completed numerous projects on WGFD enrolled Walk In Areas, including guzzlers and grass / legume cover enhancements.
- Worked closely with FSA and NRCS at state level on CRP management, haying/grazing/habitat enhancement guidelines.
- Attended joint tour Colorado DOW / Wyoming G&F in Colorado in June.
- Attended statewide WGFD / FNAWS sheep & sheep habitat planning meeting.
- Habitat extension biologist assumed John Emmerich's duties as "Project Advisor / Technical Reviewer" for all incoming Water For Wildlife Foundation projects being submitted for potential funding from throughout the western U.S., including Wyoming.
- Habitat extension biologist assisted in gaining funding for coordinating personnel and volunteers for Area 19 bighorn sheep population and habitat survey from ground and air (helicopter).
- Habitat extension biologist assisted Wheatland population biologist with deer classifications in Area 55.

Big Creek Watershed Assessment

The Level-1Wyoming Habitat Assessment Methodology (WHAM-1) was used in 2002 to begin a watershed assessment of Big Creek. The field work was completed in FY04, and a report will be completed in spring of 2004. The watershed covers 200 mi^2 (128,294 acres) in south-central Carbon County, Wyoming and northern Jackson County, Colorado (Figure 1). The average elevation of the watershed is 8,632 feet.

The Big Creek watershed is covered about equally by shrublands at lower elevations and forest at higher elevations. We observed lodgepole pine as the dominant tree in the Big Creek watershed. Subalpine fir

and Engelmann spruce also were common conifers, and aspen was widespread. We saw Ponderosa pine in a small area on National Forest land near the Forest boundary. In mountain meadows willows and alders were common along streams. Stream reaches with coniferous canopies had few willows or alders. In the shrublands, we found riparian areas with willow and alder as well as sedge/rush/grass riparian areas.

Upland conditions in the shrublands appeared relatively poor. Plant cover and composition should be examined in more detail. Bare ground was common. Undesirable plants like broom snakeweed appeared common. Rangeland management changes aimed at increasing ground cover and improving the infiltration of precipitation and runoff would likely improve aquatic habitat conditions by increasing shallow groundwater and stream flows.

Our observations of upland conditions in the forested areas did not raise many immediate concerns. Long-term and large-scale land management decisions such as road and travel management and timber and vegetation management will be most likely to influence aquatic habitat in the future.

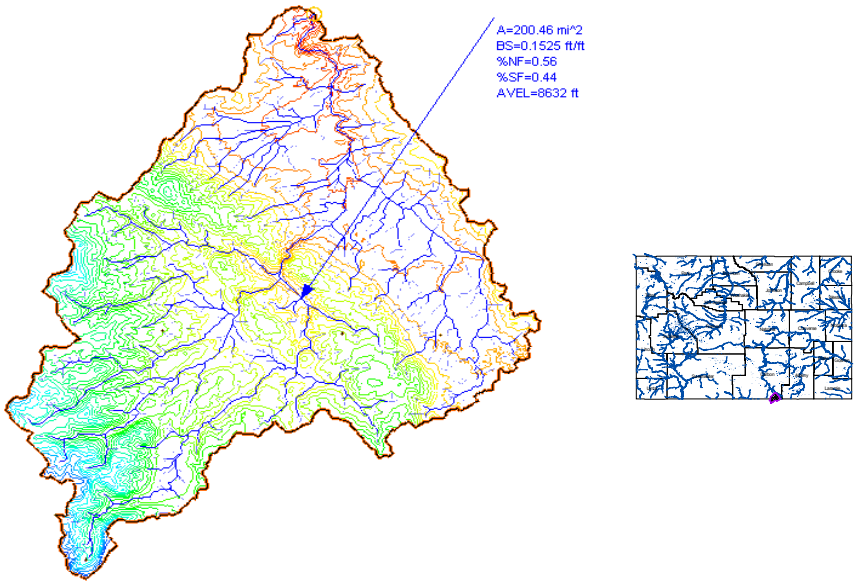


Figure 1. The Big Creek watershed (HUC1018000206), located in southeast Carbon County, Wyoming and northern Jackson County, Colorado, is within the upper North Platte River watershed (HUC10180002).

Timber harvest and management has a long history in this watershed and is continuing. Bug-killed conifers appeared to us to be common in many stands of timber, and its influence on timber harvesting and wildfires will eventually have some impacts on hydrology and ultimately aquatic habitat. Our observations led us to believe that aspen stands are gradually being replaced by conifers. Two primary reasons we are concerned with that trend is the generally larger diversity of wildlife species dependent on aspen stands and the generally drying effect that such stand replacement has on a watershed. Finally, we noted cheat grass in several areas, which raises concerns about its impact on things like fire frequency, grazing, and other unknowns like hydrology of a watershed.

In general we found stream channels were stable, bank erosion was minimal, substrates were gravel and cobble with boulders in the higher gradient canyon-bound reaches.

Pole Mountain Watersheds Assessment

The Level-1Wyoming Habitat Assessment Methodology (WHAM-1) was used in 2002 to begin a watershed assessment of the Middle Lodgepole Creek watershed. The goal is to complete WHAM-1 on the entire Pole Mountain Area of the Medicine Bow-Routt National Forest. We completed WHAM-1 on

15,360 acres in FY2004. Included in that work was an inventory of beaver dam locations and their condition. The area of the Forest we worked included the South Lodgepole Creek watershed and everything north to the Forest boundary and the Dale Creek watershed (Figure 2). Volunteers with the Travelle Chapter of the Izaak Walton League of America completed much of the beaver dam inventory. The goal is to collaborate with the Forest Service and interested groups such as the Izaak Walton League, to examine how current management actions, or the lack thereof, affect watershed conditions, wildlife habitat, and wildlife-based recreation. We will continue with watershed assessments, beaver dam inventory and plan to use GIS tools to examine relationships between beaver dam locations and densities and vegetation characteristics, such as aspen stand locations and sizes.

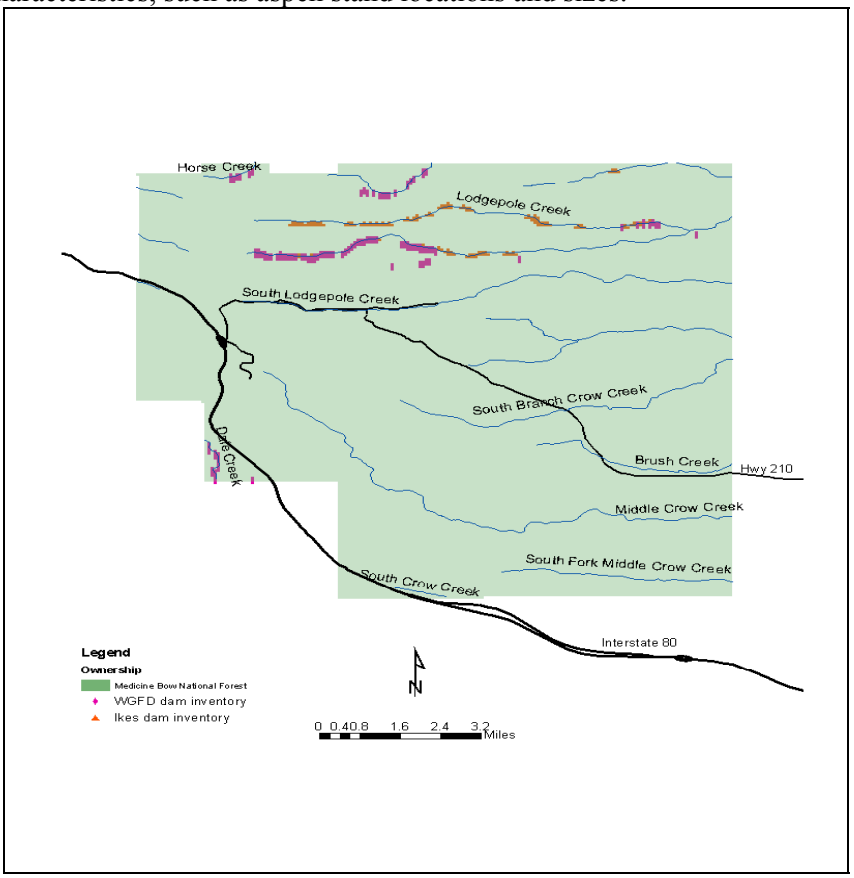


Figure 2. The Pole Mountain area of the Medicine Bow-Rout National Forest and locations of beaver dams inventoried during 2003.

HABITAT PROTECTION

Wildlife Environmental Reviews were completed on several projects. The primary one was:
Bureau of Land Management, Rawlins Resource Area, Resource Management Plan: cooperating in the development of the draft Resource Management Plan and continuing the assignment as the Department's "lead field contact" on the Plan.

WILDLIFE HABITAT MANAGEMENT AREAS

Pennock Mountain WHMA

The burn proposed for the Pennock Mountain WHMA, scheduled for spring of 2003, was postponed due to an inability to attain suitable conditions during the prescription window. The burn is a cooperative project between the BLM, USFS and WGFD. The burn area consists of an estimated 3500 acres of mixed

mountain shrubs. Approximately 487 acres of WGFD land will be included within the burn area. The burn has been rescheduled for spring of 2004.

Rawhide WHMA

Initial investigations were made into opportunities to acquire land and access at various locations around the boundary of the Rawhide WHMA. Proposals include:

1. Acquire driving access to the south side across State Land Board property.
2. Conduct land trade with private landowner (Eisenbarth) to obtain permanent access along the south side of the WHMA and N. Platte River.
3. Purchase private land (Guth) to unify access along the south side of the WHMA and N. Platte River.
4. Acquire BLM land west of the Lingle Bridge.
5. Acquire 220 acres of adjacent private land (Baumgartner) at the location where Rawhide Creek enters the WHMA, or at a minimum, enough of the property to provide contiguous access along the north side of the N. Platte River.

Johnson Creek WHMA

Continue to monitor cheatgrass control on Johnson Creek WHMA, treatment completed in 2002, *100% control of cheatgrass in treated acres with continued recovery of native, perennial grasses and forbs.

Wick WHMA

Evaluation of livestock grazing treatments on Wick WHMA, site investigations for potential upland treatments.

A high intensity / short duration grazing treatment was conducted from July 24th to August 1st on the Tom's Meadow and a portion of the Johnson Oleson Meadow. A total of 110 acres were treated using 235 cow / calf pairs in a six pasture rotation. This grazing was used as a method of removing old growth, accumulated litter and reduction of noxious weeds to promote increased spring forage on the meadows.

Goshen County Coordinated Resource Weed Management Project

Springer, Bump Sullivan, Mac's 40 Acres, Table Mountain and Rawhide are included within the Goshen County Coordinated Resource Weed Management Project. A contract was renewed with the Goshen county Weed and Pest to utilize an integrated pest management (IPM) approach. The (IPM) approach utilizes education/communication, biological, cultural, mechanical and chemical methods to manage, control and eradicate the noxious weeds within our boundaries. An additional grant of $5000 for weed control was obtained for use on Department lands from the National Fish and Wildlife Foundation.

MISCELLANEOUS

Information and Education Efforts

- Burn article for Cheyenne paper
- Conducted tour of pronghorn winter range for I&E personnel
- Field tours to private landowners, schools and colleges, sportsmen groups, natural resource professionals: 13 different events / 500 people
- Created multiple page brochure on "CRP Disking and Legume Interseeding To Improve Wildlife Habitat", 2,000 copies distributed to landowners
- Constructed and installed 30 wood duck nesting boxes on Chug Creek w/ Wheatland Junior High students
- Developed watershed and aquatic habitat posters for the EXPO
- Worked at Fish Division displays at the EXPO

- Participated in the annual Environmental Education Day sponsored by the U.S. Forest Service for Saratoga and Encampment Fourth-graders

Training

- ArcGIS Training
- Remote sensing training
- Sagebrush Workshop
- Roath Habitat Evaluation Tour – Colorado
- CWD Sample Extraction Training
- Threatened and Endangered Species Management
- Candidate Conservation Agreements
- Watershed Modeling using the Watershed Modeling System and GIS.

Membership in Intraagency Groups

- Strategic Habitat Plan Implementation Group
- Mule Deer Working Group
- Southeast Wyoming Wildlife Habitat Partnership
- Warmwater Stream Assessment Steering Committee

Project Proposals for FY 2005 Funds

- Historic Transect Data Analysis: Shrub Condition and Wildlife Utilization Trend Analysis in Southeast Wyoming
- Movement of Spawning Size Rainbow Trout in Big Creek

Land Management Agency Planning Documents

- The regional habitat biologist spent several days reviewing and commenting on the proposed revisions for the Rawlins BLM, Resource Management Plan and Routt/Medicine Bow National Forest, Forest Plan

Chronic Wasting Disease Check Stations

- Region habitat personnel participated in the statewide effort to improve Departmental knowledge of the distribution and frequency of occurrence of chronic wasting disease by spending 5 days at various meat lockers collecting lymph node samples

PINEDALE REGION

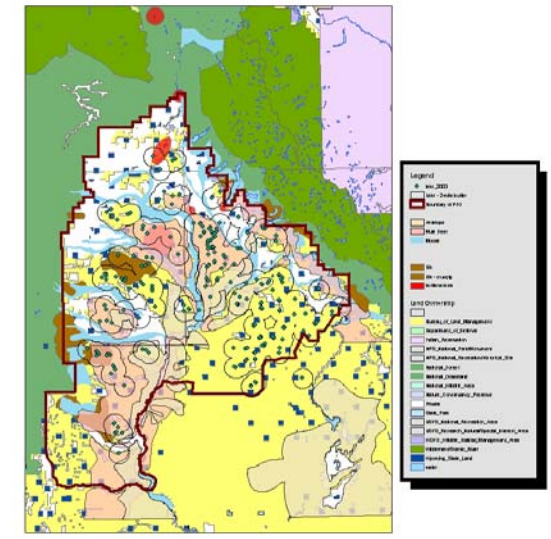
HABITAT PROJECTS

Pinedale BLM Resource Management Plan Revision

The Pinedale Terrestrial Habitat Biologist was selected as the agency's representative on this BLM effort. Considerable time was spent in meetings, reviewing planning documents, commenting and coordinating this effort. Recommendations were made to the BLM pertaining to habitat management, mitigation needs and vegetation management. The Pinedale Aquatic Habitat Biologist assisted with this effort by reviewing and commenting on various planning documents and participating in several meetings and discussions. Some of the major recommendations by the Department included:

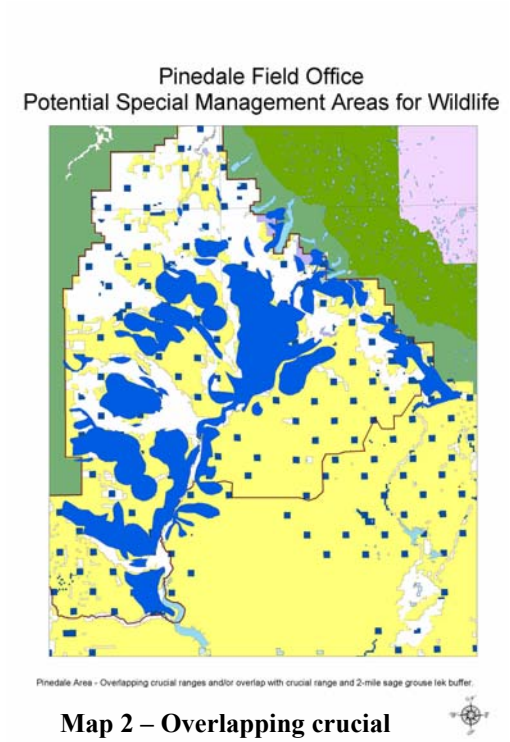
1. Using all available wildlife information including past BLM reports, WGFD reports, past WGFD habitat evaluations, vegetative data collected by WGFD and others, and coordinating habitat management with the Department's Strategic Habitat Plan.
2. Manage wildlife habitat, especially in important seasonal ranges and specific important habitats. Primary habitats recommended for intensive management included crucial winter and winter/yearlong ranges for big game and sage grouse nesting and breeding habitat (i.e. 2-mile buffer from lek).
3. Pursue site specific planning in the future such as Habitat Management Plans; especially in areas where special management is needed. Various maps were provided illustrating location and importance of many of these areas.
4. Ensure that anticipated oil/gas development does not reduce habitat functionality; especially in the habitats that deserve special consideration (those mentioned above).

Various maps were provided to the BLM and cooperators for consideration for special management. Three of these are included in this report. They include one illustrating all of the crucial winter ranges and sage grouse leks with 2-mile buffers (Map Number 1). The second map provided illustrated where there are overlapping crucial ranges, or where a crucial range overlaps with a 2-mile sage grouse lek buffer (Map Number 2). The third map produced illustrates where some of the major conflict areas are known to exist between future oil and gas development and important wildlife ranges. As a part of this effort, an effort was undertaken by the Governor's Office to establish Coordination Teams which will help guide the planning for those areas where anticipated high levels of oil and gas development overlap on these important wildlife habitats.



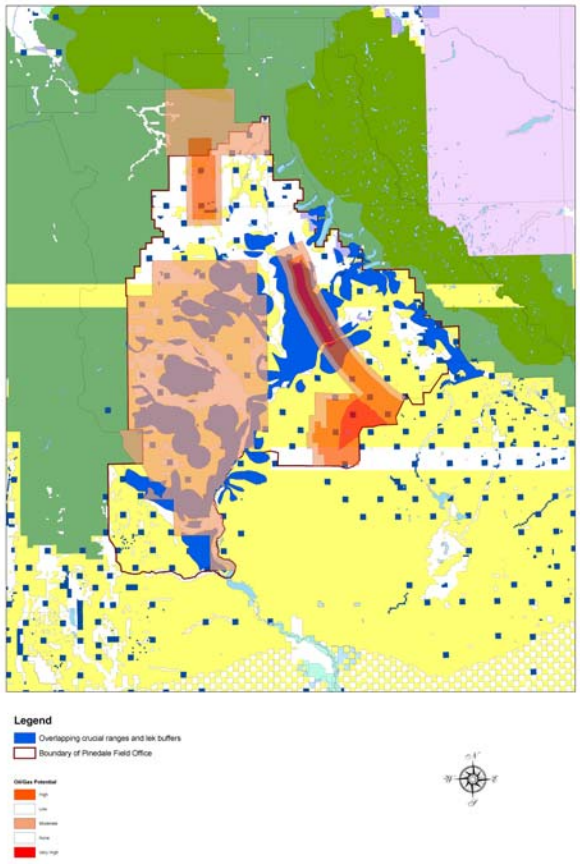
Map 1 – Crucial Ranges and Sage Grouse Leks with 2 mile buffers

This map illustrates crucial big game winter ranges, migratory bottlenecks and sage grouse leks with 2-mile buffers (nesting habitat) within the BLM Pinedale Field Office. These habitats are considered as the most important habitats but do not include other seasonal ranges such as winter, transitional, or spring-summer- fall ranges.



Map 2 – Overlapping crucial ranges, or where a crucial range overlaps a 2-mile lek buffer.

This second map illustrates where the crucial winter ranges and/or sage grouse lek buffers overlap. Within the blue areas, either two or more crucial ranges overlap, or a single crucial range overlaps with a two-mile buffer from a sage grouse lek.



Map 3 – Overlapping ranges with moderate to high oil and gas potential.

This map illustrates where oil and gas potential is moderate to high and where that is located compared to the overlapping habitats.

Kemmerer BLM Resource Management Plan Revision

The Pinedale Aquatic Habitat Biologist was selected as the agency's representative on this BLM effort. The scoping notice and the draft MSA were reviewed and comments were prepared. All regional comments were consolidated and sent to Habitat Protection.

Big Piney Ranger District Forest Service Wyoming Range Allotment Complex

Both the Pinedale Aquatic and Terrestrial Habitat Biologists provided extensive comments on the Forest Service scoping statement for the EIS and the draft EIS to determine grazing strategies for domestic sheep in this portion of the Wyoming Range. Department comments and issues were discussed in a meeting with USFS and other Department personnel. The Pinedale Aquatic Habitat Biologist participated in a tour of the Prospect Peak Allotment with the FS, permittee and other Department personnel, and assisted the FS and other Department personnel with nested frequency trend data collection in the Pickle Pass Allotment. Watershed health problems identified throughout the analysis area create a difficult challenge

for the Forest Service to adequately address the needs of the permittee, bighorn sheep, Colorado River cutthroat trout, and other wildlife.

The northern most domestic sheep allotments in this analysis area fall within a boundary identified by the Statewide Bighorn/Domestic Sheep Interaction Working Group. The boundary separates core, native bighorn sheep herds with an area that is a non-emphasis area. The core, native herds are one of the highest priorities for eliminating commingling between domestic and bighorn sheep.

Furthermore, the Horse Creek watersheds and associated tributaries, which fall within this allotment complex, support over 25 percent of the known Colorado River cutthroat trout population within the Green River drainage. Genetic tests have indicated that the cutthroat trout within these streams are genetically pure. In addition, these streams are some of the few streams located within the Wyoming Mountain Range that still allow migration and interaction between cutthroat populations within each watershed. Surveys in these drainages and the FS analysis both indicate that aquatic habitat conditions have degraded due to excess sediment loading and a decline in bank stabilizing vegetation, which has resulted in increased bank erosion. This is negatively affecting the Colorado River cutthroat trout.

Strategic Habitat Planning

The maps and the write-ups for each of the 7 priority watersheds and 2 river corridors in the Pinedale Aquatic Habitat Region were revised. The Lower Bear River Watershed was divided into the Thomas Fork and the Smiths Fork River Watersheds. Both the Pinedale Aquatic and Terrestrial Habitat Biologists participated in regional team discussion regarding livestock grazing / "grass banking" ideas and issues on the Half Moon WHMA.

Satellite Imagery Project

Work continued in the development of a proposal to map vegetative cover or habitat types using Satellite Imagery. This project will be initiated during the upcoming year and will involve the mapping of land cover on a finer scale than the GAP analysis, and to analyze changes that have occurred during the past 20 years in sagebrush communities, and development.

Cretaceous Mountain Prescribed Burn

Cretaceous Mountain Prescribed Burn - This burn was conducted in October 1993, treating 500 of 2000 acres of sagebrush within the project area. Transects were established in sagebrush and mountain shrub communities to monitor vegetation response. Macroplots were established within each of the following areas: sagebrush control (CSC-1); sagebrush burned (CST-1); mountain shrub control (CMU-1); and mountain shrub burned (CMT-1). Species composition, percent ground cover, grass and forb production, and shrub density were monitored in 1992, 1994, 1995, and 1999. Line point and shrub belt transects were performed this year for all macroplots. Production clippings were conducted only on CMU-1 and CMT-1, due to a lack of vegetation present on CST-1 resulting from extensive livestock grazing/trampling and the misfortunate placement of a salt block.

Cretaceous Prescribed Burn – 1993

Mobil Mowing Project

Mobile Oil and Gas funded this habitat treatment project that was initiated in 1996 and completed in 1998. Approximately 2200 acres within a 4400 acre project area of sagebrush considered unable to carry a fire were bush-hogged to remove decadent plant materials, reduce sagebrush competition with forbs and grasses, and improve the age structure and species composition of the sagebrush communities. The treatment area is in crucial mule deer winter range and portions of crucial elk winter range. Sage grouse have been reported strutting on mowed sites.

Two 25 meter transects were established in September 1997 (one year post treatment) in both treated and control sites. Transects were then clipped for grass, forb, and rabbitbrush production and shrub density was assessed by belt transects. This year, line point methods were used to determine percent ground cover and shrub belt transects were employed to reveal shrub densities. Plots were not clipped for production due to extremely low grass and forb growth and heavy livestock grazing.

Mobil Mowing - Untreated

Mobil Mowing - Treated

Chimney Butte Chaining Project

Chaining was employed in the fall of 1990 to treat 1700 acres within a 2200-acre project area of the East Chimney Butte Pasture of the North LaBarge Common BLM Allotment. In addition to the chaining, 800 acres were over-seeded in an attempt to increase species composition. Herbicide was also applied to a small area to test the effects of various herbicides and rates of application. A horseback rider was

contracted to enforce rest of the treatment from livestock grazing for two years post burn. Pretreatment vegetation data was collected in 1990, and post treatment data in 1991. An exclosure was constructed in the spring of 1992 to evaluate effects of ungulate grazing. The exclosure incorporates a paired sample design (treated vs. control) with three types of exclosures: all excluded; livestock only excluded; and none excluded. Line point and shrub belt transect methods were employed this year to determine species and ground percent cover.

Chimney Butte Chaining Project – 1990
Treated area with livestock exclusion

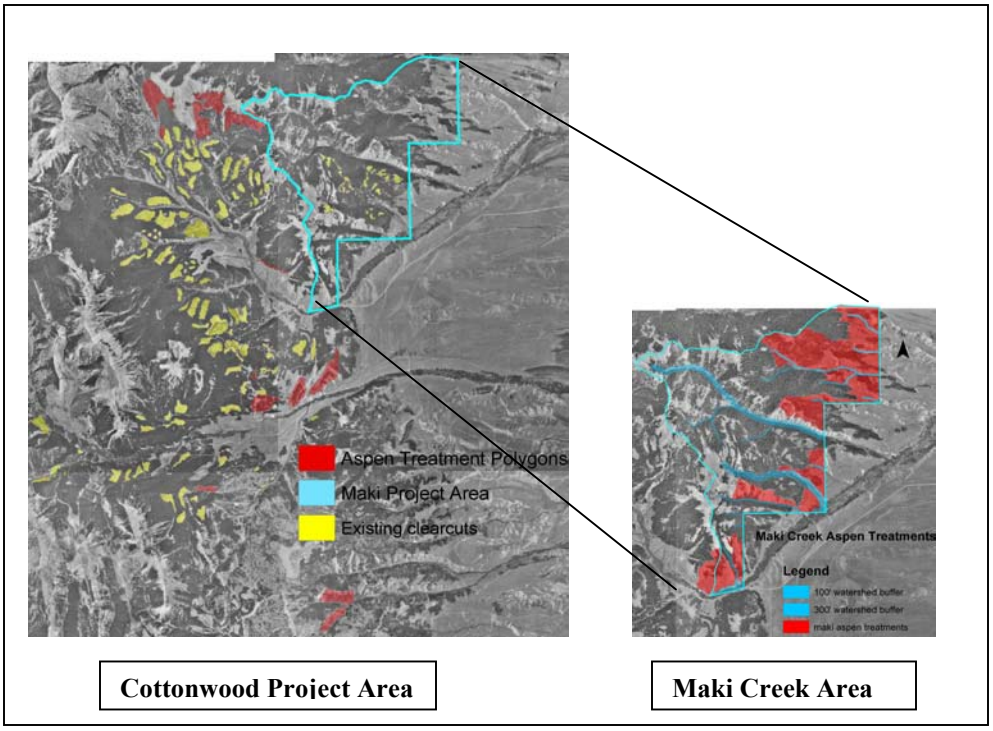
Chain

Cottonwood Watershed Projects

The Maki Creek EA is currently in review, and stemmed from the Cottonwood Plan Implementation Study. This study is an interdisciplinary approach to identify opportunities to improve resource conditions according to the Forest Plan on 48,500 acres of the North and South Cottonwood Creek drainages in the East slope of the Wyoming Range. The Plan has been broken down into smaller watersheds to facilitate implementation. Maki Creek, the first subdivision of the Cottonwood Project to be reviewed, involves various timber harvest units and thinning projects along with prescribed fire treatments on important elk and mule deer transitional and parturition ranges, and heavily conifer-encroached stands of aspen. Preliminary aspen community typing of ninety-one sites conducted in the area by the Piney BFH biologist revealed 84% of seral aspen stands were in the conifer-climax habitat types. These aspen communities risk eventual conifer domination and the loss of multiple resource values associated with stable aspen communities.

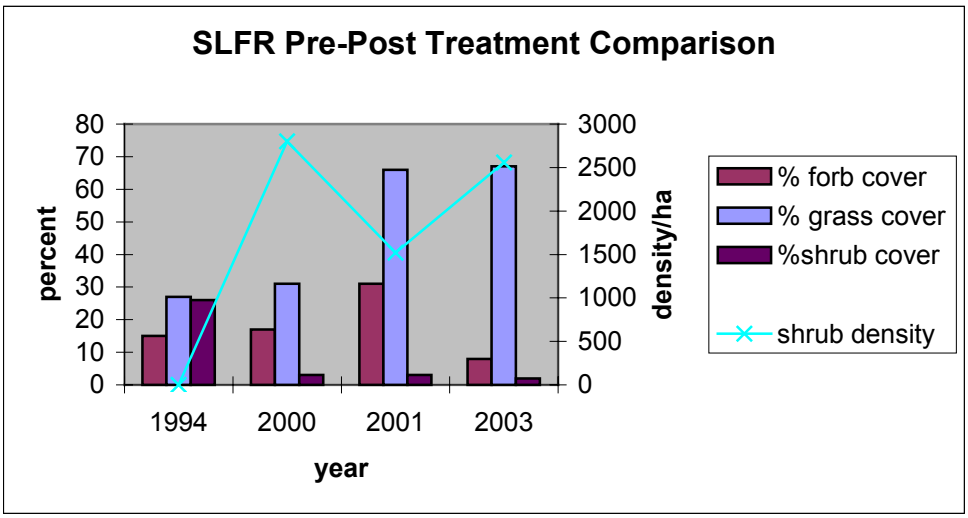
The Piney BFH biologist conducted Stand Exams in aspen treatment polygons at the request of USFS personnel to expedite data collection and project approval. Tree heights, ages, DBH, basal area, and community type include some of the data collected. Data summaries will be provided in next year's report.

Fire treatments are expected to be implemented in the fall of 2005.



Fremont Ridge Burn

The Fremont Ridge burn was a prescribed burn conducted in the fall of 1999. The macroplot (SLFR) was established and read in 1994; 5 years prior to treatment. Data comparisons pre treatment and post treatment show a 47% decline in aerial shrub cover. Shrub density was not collected prior to treatment. Macroplot SLFR experienced an increase in forb production and a decrease in grass production from 1994 to 2003. However, when comparing production between 2001 and 2003 both grass and forb production decreased in 2003 by 78% and 57% respectively. This discrepancy could be due to an on-going drought in the area. Forb aerial cover decreased from 1994 to 2003, by 47% and grass aerial cover increased 28%. Again comparing 2001 to 2003, SLFR experienced a 75% decrease in aerial forb cover and a 3% increase in aerial grass cover. When comparing 1994 to 2003 data, basal cover for bare ground increased 83%, and litter increased 38%. The dominant grass species were *Bromus tectorum* (BRTE) and *Elymus spicatus* (ELSP3), and the dominant forb species was *Balsamorhiza sagittata* (BASA3).



Aerial cover for forbs and shrubs is decreasing, however, grass aerial cover is increasing slightly. Bitterbrush establishment through resprouting and seeding is continuing to increase. It would be expected that shrub density will increase over time. Basal cover generally increased for bare ground and litter. The increase in bare ground could be attributed to the effects of four years of drought in the area. The production of grasses and forbs also decreased, again this could be due in part to the effects of a prolonged drought.

Boulder-New Fork Project

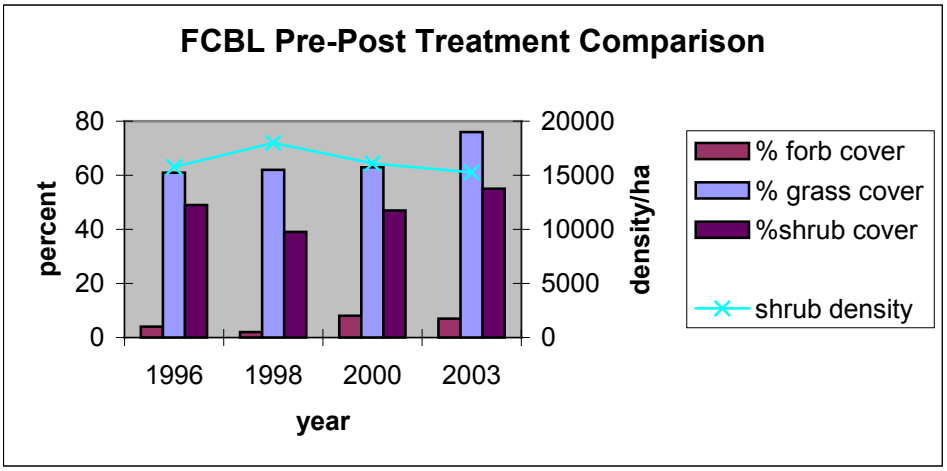
This project seeks to treat approximately 1194 acres of sagebrush and 1483 acres of aspen using prescribed fire. Four new macroplot transects were established in proposed treatment areas. The WGFD is working cooperatively with the Bridger-Teton National Forest to accomplish these prescribed burns. The goal of the planned prescribed burns is to set back plant succession and create a mosaic of diverse vegetation among vegetative communities and over the whole landscape. The vegetation objectives for the aspen communities is to provide a mosaic of seral stages, obtain a sucker density of 20,000 stems/acre 2-3 years post burn, obtain a sucker density of 1,000 stems/acre that are >10 feet in 10 years post burn, obtain total ground cover of 95% in 5 years post burn, increase herbaceous production by 100% in 3 to 5 years post burn, and have no net loss of species diversity in 5 years post burn. The vegetation objectives for the sagebrush communities is to provide a mosaic of seral stages, obtain total ground cover of 85% in 5 years post burn, increase herbaceous production by 100% in 3 to 5 years post burn, and have no net loss of species diversity in 5 years post burn.

Aspen inventories were conducted in the New Fork-Boulder allotment using aspen circular plots. This method of sampling is used for monitoring pre- and post-treatment stem densities in treated aspen stands with greater efficiency. Data collection included UTM location of the witness post, establishment of a permanent photo point with photos taken in the four cardinal directions, and density information by height class.

New Fork-Boulder Aspen Sampling

Boulder Lake Project

One macroplot site (FCBL03S) was monitored during the 2003 field season. FCBL was treated with spike in the spring of 1998. This macroplot is located north of Boulder Lake on the bottom of the south face of Boulder Ridge. FCBL03S is located in an area that was treated with spike in the spring of 1998. There is no "control site" for this area. Data collected prior to treatment in 1996 showed an aerial shrub cover of 49% and density of 15760 plants/ha. In comparison to the 2003 data, this is a 13% increase in aerial shrub cover and a 3% decrease in shrub density. Production was not collected pre-treatment. Aerial forb cover increased by 62% and aerial grass cover increased by 24%, from 1996 to 2003. When comparing 1996 to 2003 data, basal cover for bare ground decreased 16%, litter increased 14%, and plant cover decreased 100%. The dominant grass species were *Elymus spicatus* (ELSP3) and *Bromus tectorum* (BRTE), and the dominant forb species were *Hackelia* (HACKE) and *Phlox longifolia* (PHLO2).



Aerial cover for grasses, forbs, and shrubs is increasing with shrub densities still remaining low, as to be expected. Species dominants were altered by the addition of larger amounts of *Bromus tectorum* being present within the macroplot site. Bitterbrush resprouting is continuing to increase. Production of grasses decreased in the burned area from previous years. This decrease in production could be due in part to the effects of a prolonged drought.

Fremont II Project

Work continues on this project located above the Soda Lake WHMA. Numerous projects have been completed in this area in the past. Fremont II proposes to use both prescribed fire and mechanical treatments to enhance approximately 2000 acres of aspen/conifer and sagebrush communities. Project objectives include: increasing the quantity and quality of big game and livestock forage, increase vegetative diversity and age structure, reduce conifers in aspen stands, diversify seral stages of aspen and sagebrush, and increase natural fuel breaks by expanding the aspen component. This project is scheduled for completion during the upcoming field season.

Habitat Projects – Prescribed and Natural Fire

Clear Creek Fire

The Clear Creek Fire was a wildfire that occurred this year in the Upper Green River Drainage. The fire was in an area that was previously identified by the WGFD for potential burning for bighorn sheep.

The Mule Fire

Assistance was provided to GTNP personnel in monitoring fire severity on the Mule Fire in the Wyoming Range.

Wyoming Range Mountain Mahogany Transects

Mountain mahogany production and utilization has been collected since 1993 in the Kemmerer area and since 1997 in the Big Piney area. Production information illustrated for 2003 again is low due to the continued drought. Utilization has not been collected the last 2 years due to the poor production; and difficulty in trying to collect adequate information. When production is less that ½ inch, it has appeared that browsing occurs as much on the older growth as it does on the annual growth.

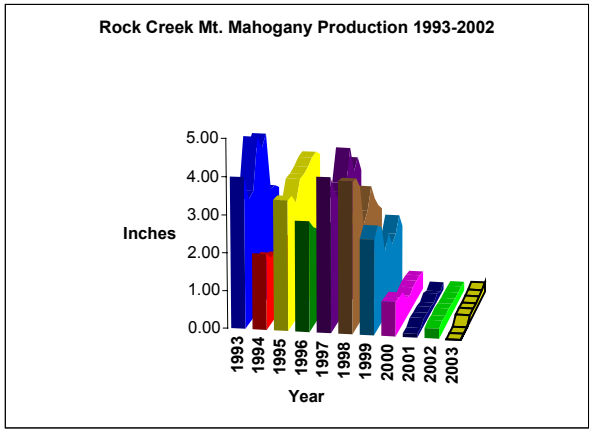
Big Piney Area

	Production (inches)			
Site Name	**Transect 1**	**Transect 2**	**Transect 3**	**Average**
Wildcat Canyon	0.169	0.204	0.24	0.20
Bird Draw	0.362	0.211	0.193	0.26
Saddle Ridge	0.16	0.21	0.27	0.21
			AVERAGE	**0.22 inches**

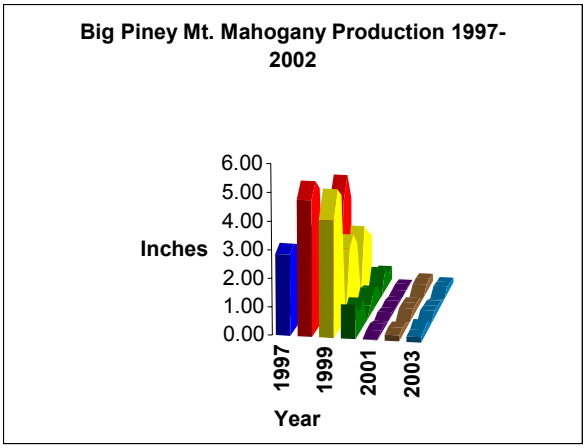
Rock Creek Ridge

	Production (inches)			
Site Name	**Transect 1**	**Transect 2**	**Transect 3**	**Average**
S. Fk Leeds Cr.	0.25	0.19	0.19	0.21
Nugget Canyon	NA	NA	NA	NA
N. Fk. Leeds Cr.	0.16	0.18	0.16	0.17
			AVERAGE	**0.38 inches**

2003 Mountain Mahogany Production



Graphs illustrate mountain mahogany production from 1993 to the present.



Big Game Migration Corridor Fence Modifications

The Pinedale crew assisted Wildlife Division personnel and the Wildlife Heritage Foundation of Wyoming with the replacement and modification of 21.5 miles of highway right-of way fence. This project modified existing woven wire and other stock fence that acted as an impediment to migrating ungulates. The goal of the project was to work cooperatively with landowners and the Wyoming Department of Transportation (WYDOT) to modify existing fences to better facilitate free passage of migrating animals. The Wildlife Heritage Foundation funded the project through a grant that paid three separate contracts. The contractors were monitored and the project inspected by Habitat and Access Maintenance personnel.

Left: Deer mortality within the migration corridor near Daniel was high prior to fence modifications.

Right: A completed section of the new wildlife friendly highway fence.

Bighorn Sheep Efforts

The terrestrial habitat biologist continues to be involved in the Bighorn Sheep Working Group and serving on that committee.

Efforts are undertaken in the region every year to examine some areas for sheep distribution and habitat-related concerns or needs. This year, 2 trips were taken, one to Fish Creek Mountain to survey for sheep and the second was in the Upper Green River to survey/document habitat conditions.

Head of Clear Creek near Faler Lake

Lower Bear River Watershed Projects

Administrative: The Pinedale Aquatic Habitat Biologist coordinated extensively with the Kemmerer BLM wildlife staff and Fire Fuels Specialist as well as Pinedale Regional Fisheries Management and Green River Terrestrial Habitat Biologist to review and discuss on-going projects and opportunities in the Kemmerer BLM Resource Area. Various project proposals, which had been previously submitted to the BLM, were hand delivered to new BLM personnel. These were also reviewed and discussed in greater detail with Green River Terrestrial Habitat Biologist.

Cokeville Meadows Wildlife Refuge Area: Participated in meetings and discussions with USFWS and other Department personnel to review and discuss opportunities and limitations associated with potential habitat enhancement on this area.

Smithsfork Allotment: *G*razing plans proposed for the 2003 grazing season were discussed with the BLM and concerned public and the draft AMP was reviewed and comments provided.

Observations of heavy use levels in Raymond, Huff & Little Muddy Creeks were corroborated in the BLM's "2003 Smithsfork Allotment Monitoring Report." This report also documented similar use levels throughout the entire allotment. Essentially all of the concerns expressed and potential problems projected in the draft AMP comments occurred during the 2003 grazing season. The situation was discussed extensively with the BLM Wildlife Biologist. However, the Allotment Management Plan proposed in December was virtually identical to the plan, which failed miserably during the 2003 grazing season. A letter outlining Department concerns was prepared and sent to the BLM. Unfortunately, however, these concerns were not satisfactorily addressed in the final decision.

In July livestock utilization and habitat conditions were evaluated on Raymond, Huff, Coal, Little Muddy, and Klein Creeks. Livestock use levels in Raymond and Huff Creek watersheds were assessed again in September. Willow and stubble height use criteria were exceeded in both drainages even though the Raymond watershed was supposed to be rested. These issues were discussed with the BLM Wildlife Biologist.

Use levels and maintenance needs on the Coal and Little Muddy Creek exclosures were evaluated and discussed with the BLM Wildlife Biologist. The Little Muddy exclosure fence had been cut in several places.

Klein and Huff Creek Head-Cut Control Projects: Approval from the Forest Service to use a rock source located on Packstring Creek was secured for these projects. The Klein Creek head cut control project was installed in October with assistance from the Casper Regional Aquatic Habitat Biologist, Fisheries Management, and HAMS personnel. Rock was delivered to two active head cuts on Huff Creek. The Notice of Intent (NOI) for the Huff Creek projects needs to be sent to the COE office and final approval gained from the state and private landowners. Final approval for fencing both projects is pending.

Coal (Howland) and Sawmill Creek Projects: The BLM Wildlife Biologist proposed construction of an exclosure on Sawmill Creek. This opportunity was discussed extensively and will likely result in a grant proposal from the BLM for FY05 funding.

Two separate potential projects to address fish passage concerns were written up and discussed with the BLM Fisheries Biologist. The first of these is the Coal Creek / Smiths Fork Road culvert. Fish passage limitations were evaluated and the culvert slope measured using the FS "Juvenile Fish Passage Through Road Crossings Assessment" format. That information was forwarded to the BLM Fisheries Biologist. This effort will likely result in a grant proposal from the BLM for FY05 funding.

Hobble Creek Project: A Trust Fund Proposal was developed in cooperation with the Forest Service and Regional Fisheries Management to provide Department funding to assist the Forest Service with implementing an erosion control / sediment reduction project associated with the road on Hobble Creek. A letter of support for the 404 permit was written and sent to the COE in March. The Forest Service successfully completed implementation of the first phase of this project in October and plans to apply for additional Department funding in FY05 to complete the second and final phase of this project in the fall of 2004.

LaBarge Creek Habitat Restoration and Inventory

The Pinedale Aquatic Habitat Biologist coordinated with the Pinedale Terrestrial Habitat Biologist and Fisheries Management to prepare a schedule and agenda for the workshop with Alma Winward to identify willows and other plants and review / summarize the LaBarge greenline data. Workshop notes were summarized and sent to Alma for final editing. A greenline summary report and associated management recommendations were drafted and revised after the workshop then sent to Winward for final review. This summary will be incorporated into the LaBarge Watershed Habitat Report. The Landscape Assessment prepared in 2001 by the Forest Service was reviewed and relevant information was incorporated into this report.

An excel spreadsheet and plant species list for Level 2 greenline data were developed. Data was then entered and analyzed, which prompted a riparian literature search and review in an effort to more clearly interpret the mixed results. Photos from Level 1 inventories on the mainstem of LaBarge Creek were labeled and Level 1 WHAM data was entered into tables. WHAM Level I data which had previously been entered into the database was edited and corrected.

BLM - Rock Creek Cooperative Projects: Potential exclosure reconstruction and other project ideas (e.g. aspen regeneration, old barrier maintenance or removal, livestock management needs, etc.) on Rock Creek were evaluated in November with Fisheries Management and the BLM Range Specialist and Wildlife Biologists. The BLM has since secured a portion of the funding needed to reconstruct the exclosures and plans to apply for Department grant money to cost share this project. On the ground assistance for construction has also been informally requested by the BLM.

Upper Green (above Warren Bridge) River Projects

Warren Bridge Access Area Projects: The Pinedale Aquatic Habitat Biologist investigated project opportunities on the Anselmi property in the Warren Bridge area. Discussion followed as to whether to pursue basic enhancement projects (e.g. tree-jams, etc.), or develop more involved river restoration projects to address excess width depth ratios and other morphological concerns. Issues regarding Warren Bridge and Fear Easement Access areas were discussed with the BLM Recreation Planner.

Upper Green Willow die-back: The Pinedale Aquatic Habitat Biologist investigated a willow die back in the upper green with Dr. Alma Winward, other Department personnel, and area landowners. Notes were summarized and sent to Winward for final editing.

New Fork River Corridor Cooperative Projects

Wild Horse Subdivision Bank Stabilization Projects: A landowner (Sanchez) that was provided funding in FY02 for a Group Riparian Habitat Project (Sanchez / Feltner Group Project) recently purchased an upstream adjoining parcel and submitted a grant proposal for FY03 contingency funding to continue the earlier stabilization efforts upstream for another 360'. Also, the next neighbor upstream (Halls) decided to cooperate in this effort and proposed adding another 340' to the overall project.

The Pinedale Aquatic Habitat Biologist assisted Sanchez and Hall with preparation of Riparian Habitat Grant proposals, and in April assisted the NRCS with stream survey data collection for this project. In June & July this project was discussed at length with the NRCS, landowners and Wolff. However, due to timing limitations for implementation, budgetary restraints, and the lack of commitment by Hall, we were not able to contribute financially.

A potential bank stabilization project on property owned by McMurry, across from the "Wild Horse Subdivision" was evaluated with Fish management. Due to time limitations we recommended the landowner hire a consultant to design and implement this project. Future opportunities to develop large-scale woody species regeneration projects with emphasis on cottonwoods were also discussed with a large acreage landowner (Sullivan).

Two riparian exclosures, one protecting cottonwoods and the other protecting aspen, on Jerry Kirk's property were evaluated with the NRCS. These were constructed in the spring of 2003. Fall livestock browsing on all woody regeneration outside was very heavy. Leader lengths were measured inside the exclosures to estimate use by moose in the spring.

New Fork Tributary Projects: Pine Creek – Fish Habitat Projects: A potential enhancement project on Neely's property on Pine Creek in the town of Pinedale was evaluated. The landowner would like the Department to design a small fisheries habitat enhancement project in honor of Ron Remmick.

The proposed Pine Creek hydropower project was reviewed and discussed with fisheries management.

Duck Creek - Potential projects on 1 ½ miles (1200 acres) of Duck Creek (adjacent to the State and BLM land on Duck Creek) owned by Mike Fenn were evaluated. A summary of evaluation was written and potential preliminary projects were marked for the landowner.

WILDLIFE HABITAT MANAGEMENT AREAS

Black Butte WHMA Spring Rehabilitation Project

Recent drought conditions caused the spring at Black Butte to dry up. The old spring box was excavated and re-built then set behind a water barrier material. Water flows have increased although the drought continues.

The spring that has supplied water to the horse corral and a water tank used by wintering elk and other wildlife was drying up. Drought conditions through recent years along with the degredation of the spring box (circa 1977) due to age had diminished water flows to a trickle during summer and nothing in winter when it is most needed. The Pinedale Habitat and Access Maintenance crew excavated the old spring site and constructed a larger collection pipe. The pipe was set approximately 2½ feet deeper than the old box and a water barrier was placed to serve as an "underground dam" to hold water in the collection area. The barrier material used was heavy-duty pit liner donated by Shell Exploration & Production Company. The water collection area was then filled with washed gravel, which formed a much larger "catch basin". The topsoil was replaced and the area was re-seeded.

Huston Public Fishing Access Area

Primary development of this 30-acre acquisition, which provides for public hunting/ fishing and enhancement of riparian habitat, was completed in 2002. A project update / summary (including a "Stream Habitat Improvement Construction Report") for the Huston Access / Moore Property project was completed in 2003. The Pinedale Aquatic Habitat Biologist and the HAMS crew cooperatively completed the fence tie-in needed at river crossings in April and necessary annual fence repairs at the river and side channel crossings again in September.

Jerry Moore Riparian Habitat Improvement Projects:

The need to develop a grazing and monitoring plan for the Huston Access Area / Moore property as well as trespass livestock concerns were discussed with Moore's consultant (Dahlke). Efforts will be made to develop this in conjunction with a vegetation monitoring plan for the entire Huston Access/Moore Property area. The Pinedale Aquatic Habitat Biologist assisted the landowner with completing the Riparian Grant Close Out report.

The "J-Hook" cut-off channel on Moore's was evaluated with Binns, Fish Management, and Dahlke. Ideas and suggestions were summarized and the costs of past, similar projects were reviewed to estimate project costs. A longitudinal profile and X-sections were surveyed in May with assistance from Fish Management. This data was entered into spreadsheets partially as practice and preparation for the Rosgen course.

It became clear that some of the data would need to be collected again. This was completed in October with assistance from Fisheries Management. A portion of this data has been re-entered into spreadsheets. This project and alternative / back up projects were discussed at length with Dahlke, the NRCS, and Audubon, who has approximately $15,000 ear marked for this project. A letter was prepared and sent to Audubon supporting some line item changes in NAWCA grant funds for these alternative projects.

MISCELLANEOUS

Terrestrial Habitat Biologist

- Assistance in planning/organizing the Sagebrush Workshop, including presenting a paper and chairing a session.
- Assistance with planning/implementation of the Deer/Elk Workshop.
- Assistance at the EXPO
- Presentation given at the Big Game/Big Industry Workshop held in Pinedale.
- Attendance – 7 Habits Course
- Attendance – Colorado Field Tour
- Providing information and attendance of field evaluations with Alma Winward. Field evaluations included tall forb communities in the Wyoming Range, Sagebrush Ecology on the Mesa, and examination of the Big Piney-LaBarge Treatment Sites.
- Provided GIS Expertise in the region, including the updating of new seasonal range maps for mule deer, elk and moose. Other assistance was provided to other divisions also.

Aquatic Habitat Biologist

Habitat Grant Projects:
-Inspected and approved FS sponsored maintenance work needed on the Green River fisheries enhancement projects completed in 1993.

In Service Training:
-Read the book "Applied River Morphology" and participated in this Rosgen course held in Pagosa Springs, CO
-Attended the Fish Division meeting and Water Law Workshop
-Participated in the Sagebrush Management workshop held Rock Springs
-Annual CPR refresher course
-Toured the Little Mountain Project area and 2000 wildfires
-Participated in the "7 Habits of Highly Effective People" course
-Toured portions of the Steamboat Mountain habitat enhancement project area
-Participated in Fisheries Forum Meeting

Inter Agency Coordination:
-Participated in "Local Work Group" meetings regarding NRCS administered EQIP & WHIP projects. The need for a revised Sublette County WHIP plan was discussed with the NRCS and suggestions for revising the 1997 plan were provided. Also, the NRCS – WHIP Project Ranking Worksheet was reviewed and comments were provided to the NRCS.

-Reviewed and provided comments on numerous BLM grazing permit renewal EAs from both the Pinedale and Kemmerer BLM offices.

-Both the Pinedale Aquatic and Terrestrial Habitat Biologists reviewed information on the BLM's proposed 4Cs project and associated permitttee monitoring and discussed these issues with the NRCS. Met with the Pinedale BLM and permittees to discuss this effort proposed for several allotments in the East Fork watershed. Department concerns with the methodology as compared to the on-going permittee monitoring effort, involving many of the same permittees on the adjacent FS Silver Creek Allotment were discussed but not resolved.

-Reviewed the protocol for the Forest Service sponsored Inland West Watershed Initiative (IWWI) and participated in the evaluation process for the Pinedale Ranger District.

-Met several times with the local Forest Service Fisheries Biologist to tie up loose ends on various projects

-Participated in a forest-wide WGFD / BTNF coordination meeting

-The scooping notice for the proposed South Piney CBM project was reviewed and discussed with fisheries management and comments were provided.

Cooperative Habitat Extension Projects: Fisheries potential on a 40-acre property on Horse Creek south of Daniel was evaluated with a potential conservation buyer who later decided not to purchase it because of concerns with the high probability of oil and gas development.

Habitat and Access Maintenance

- The Pinedale Habitat and Access Maintenance crew modified 2¾ miles of stock fence on the Halfmoon WHMA to Department specified height to facilitate mule deer migration and antelope movement.
- Halfmoon Grass-bank Project: The Pinedale Habitat and Access Maintenance crew is working with the Department Engineer to have a well drilled and a solar pump and stock tank installed next spring for wildlife and stock water on the Habitat Area. Water availability limits the distribution of use on the area by both wildlife and livestock. The area may be used as a grass-bank to rest other areas while they receive habitat treatments.
- Huff Creek/Stoner Creek (Project Request): The Pinedale Habitat and Access Maintenance crew assisted with the completion of the two stream stabilization projects that were requested by the Aquatic Habitat Branch. Approximately 30 cubic yards of rock were hauled and placed at the two project sites.

SHERIDAN REGION

HABITAT PROJECTS

Bighorn National Forest Beaver Transplant Project

Habitat personnel initiated efforts to trap and transplant beaver into unoccupied, but suitable habitats on the Bighorn National Forest (BNF). Funding was secured from the Rocky Mountain Elk Foundation, Governor's Big Game License Coalition funds and Bow Hunters of Wyoming to contract the trapping and transplant work. A volunteer was enlisted to digitize current and historic beaver-cache inventory data in a GIS. These data, along with willow and aspen inventory, and topography data were used to identify unoccupied watershed segments with potentially suitable habitats. Habitat personnel appraised potential sites and prioritized release locations. Transport cages and a larger holding cage mounted on a trailer were prepared for use by contract trappers. Four trappers were contracted and permitted to transplant beaver. One trapper caught and released six beaver in the southern BNF. Several landowners along Wolf Creek, Goose Creek, and the Tongue River requested consideration as a potential source for future trapping and transplanting efforts to alleviate damage concerns on their property. The project will continue in 2004.

Bighorn National Forest Land and Resource Management Plan Revision

The revision of the U.S Forest Service (USFS) Bighorn National Forest Land and Resource Management Plan (Plan) is an important issue concerning wildlife and their habitats in the Sheridan Region. Habitat personnel began involvement during the scoping process in January of 2001. A draft Plan is now ready for public comment. A Decision Notice is tentatively scheduled for the winter of 2005. Specific activities completed in 2003 included the following:

- ✓ Worked with BNF personnel to create standards and guidelines advantageous to wildlife resources. Much of this process involved developing and analyzing security areas for elk. A report titled *Elk Vulnerability- Maintaining Elk Hunting Opportunities on the Bighorn National Forest* was written and is presently being printed. Research indicates the importance of cover to elk survival through hunting seasons. Providing adequate security areas make elk harder for hunters to find, thus allowing liberal hunting opportunities with reduced elk vulnerability. For instance, starting in the mid-1960s, accelerated timber harvest removed elk hiding cover while logging roads permeated previously secluded areas. With better access, the BNF was deluged with hunters by the mid 1970's. Responding to public concerns about hunt quality and fewer mature bulls (a symptom of rising elk vulnerability), the WGFD reduced season lengths and switched to limited-quota permits. This resulted in a long-term decrease in elk hunting opportunities. Today, about one-third the number of hunters and recreation days found in the 1960's, 70's and 80's remain. The loss of hunting opportunity resulted in the loss of license revenues to the WGFD and income to the state's economy. Elk hunters on the Big Horn Mountains spend about $7-9 million dollars per year pursuing their sport, as opposed to $10-17 million in previous decades (2002 dollars). Fewer bull elk also reduce other tourist-based economies. For instance, tourism income in Wyoming is approaching $2 billion annually. Hunting outfitters alone contribute $90 million to the state's economy.
- ✓ Assisted the BNF to monitor wildlife use of willows on the North Tongue River (Figure 1).

Figure 1. Marked willow leaders were assessed by a BNF employee to estimate big game use in an area of the North Tongue River.

- ✓ Met with BNF personnel, the State's planning analyst and cooperating agencies on several occasions to discuss and comment on standards and guidelines, and the proposed alternatives.
- ✓ Analyzed reports regarding species emphasis categories and proposed management indicator species.
- ✓ Provided habitat expertise to WGFD representatives of the Forest Plan Steering Committee.
- ✓ Reviewed species assessments for the water vole and pine marten.
- ✓ Met with BNF personnel to discuss the affects of an ATV loop tour development on wildlife. A geographic information system (GIS) was used to demonstrate how BNF management has roaded the best wildlife habitats. Few productive wildlife habitats (flat terrain) remain that do not have roads within one-half mile, making it difficult for road-sensitive species like elk, bear, and martin to make use of these habitats.
- ✓ Assisted with the development of willow and aspen use guidelines for the Plan. WGFD and BNF personnel met to discuss wildlife browsing of these resources and the impacts and solutions to overuse issues. BNF personnel are reluctant to implement future aspen or willow regeneration treatments unless the sites can be fenced to exclude big game and livestock.
- ✓ Calculated a new moose carrying capacity estimate for the BNF. We lacked information about moose diets to derive an accurate estimate, despite the availability of better habitat inventory data.
- ✓ Participated in a tour of the BNF with USFS aspen specialist Dale Bartos to discuss management opportunities to retain aspen stands. The information was used to develop guidelines for the Plan.
- ✓ Met with Department of Environmental Quality Water Quality Division personnel to review the draft standards and guidelines from a water quality perspective. The BNF is not planning to collect water quality data since the state of Wyoming has primacy for water quality regulation.

CCRP Riparian Buffer Project on Clear Creek

This project involved an NRCS/FSA Conservation Reserve Program Riparian Forest Buffer practice, which will exclude livestock grazing for a 15-year period. The WGFD provided additional incentive for the landowner to enroll these lands. Approximately 138 acres consisting of 54 acres (qualifying) of riparian forest along Clear Creek were fenced. Wildlife habitats will be enhanced within this area by controlling leafy spurge, installing stream structures and planting deciduous woody vegetation. Improved structural diversity and greater vegetative cover will greatly enhance habitats for a variety of wildlife species. The fisheries will also recover from reduced sedimentation, increased vegetation and a narrower and deeper stream channel. About 8,500 feet of 4-wire fence were constructed to exclude livestock. Natural regeneration will likely restore an effective woody riparian buffer.

CCRP Wildlife Habitat Buffer Projects in Crook County

Two Continuous Conservation Reserve Program (CCRP) buffer projects, which totaled 185 acres, were completed in Crook County. Fences were constructed to exclude livestock grazing from the drainages encompassing the project areas. The goal of each was to passively restore riparian and wetland habitats. Both projects were contracted under the wildlife habitat buffer practice, which allows marginal pastureland adjacent to wetlands or streams to be included in the fenced buffer and requires no minimum amount of woody vegetation at the end of the 15-year contract. Figure 2 depicts a segment of one of the project sites.

Figure 2. Wetland habitat excluded at the King CCRP wildlife habitat buffer in Crook County.

Cole Canyon Creek Beaver Transplants

Beaver, which were live-trapped by fisheries management and aquatic habitat personnel from the Green River region during late spring in the Little Snake River watershed, were transplanted to the Turtle Lake site on the North Fork of Cole Canyon Creek within the Bear Lodge Ranger District of the Black Hills National Forest (Figure 3). Bear Lodge Ranger District personnel assisted with the transplants. Unfortunately, only two beaver were trapped and subsequently released. Hence, supplements of additional beaver will be necessary to realistically expect a colony to successfully establish on the stream segment.

Figure 3. A translocated beaver after it's release at Turtle Lake, which is a relic beaver pond.

Dayton Meadows Instream Habitat Improvement on the Upper Little Bighorn River

Riparian greenline, cross-section and woody plant regeneration transects were completed at Dayton Meadows, which is the site of a 1990s era stream improvement project completed by aquatic habitat and construction personnel, to establish permanent riparian monitoring. Ecological status along the riparian greenline was rated as late successional (76%), bank stability was rated as high (7.86 of a possible 10), and mesic-dominated plant communities comprised 91 percent of the greenline community composition. Ecological status across riparian cross-section transects was rated as very early successional (2%). Late successional communities represented 18 percent of the cross-sectional community composition. Mesic–dominated communities comprised 34 percent of the cross-sectional community composition. The woody plant regeneration assessment indicated seedlings were absent and saplings were under represented in the riparian complex.

Dead Swede Campground Stream Rehabilitation Project on the South Tongue River

Tours were completed with BNF personnel and the contractor completing the work prior to and during the rehabilitation efforts. The project, which was funded and overseen by the BNF, was completed in early October. Most of the instream structures, channel realignments, and revegetation work appeared to meet design standards.

Elk Conservation Plan

A report titled *A Rocky Mountain Elk Habitat Conservation Plan for the WGFD Sheridan Region (and portions of the Cody Region)* was completed. Strategies for maintaining and conserving the Sheridan Region's elk habitats are outlined in this report. It also includes ten years of research, investigations and program reports that describe how and why these strategies were proposed. Supplemental reports included:

- ✓ *Rocky Mountain elk vulnerability within the Bighorn National Forest.*
- ✓ *Rocky Mountain elk habitat effectiveness on the Big Horn Mountains.*
- ✓ *Remote sensing of regenerated conifer stands to delineate elk hiding cover.*
- ✓ *Enhancing and conserving elk winter ranges while providing for hunter access to private lands.*
- ✓ *Crucial winter range enhancement on WGFD Wildlife Habitat Management Areas- east slope of the Big Horn Mountains.*

Extension Service Contacts and Technical Assistance

The habitat extension service program has diminished in recent years. Fewer activities now occur on private lands. This is due in part to the postponement of WGFD habitat grants and the dwindling effect of

going several years without a habitat extension biologist presence in Sheridan, Buffalo, or Gillette NRCS offices. This interruption in funding and staffing has resulted in lost opportunities to leverage Farm Bill funding and advance the agencies Strategic Habitat Plan. It's apparent that placement of a habitat extension biologist in NRCS offices allows the agency to find hidden opportunities and to build the trust and acceptance needed for an effective program with private landowners. Technical services provided during the year included the following:

- ✓ The terrestrial habitat biologist assisted eleven landholders with their wildlife habitat projects. This consisted of brief verbal or written recommendations for shelterbelt design, electric fence installation, prescribe burn guidelines, reclamation seed mixtures and coal-bed methane (CBM) mitigation opportunities for wildlife. Other assistance consisted of working with a developer to minimize sub-urban effects on wildlife and providing data and information to several consultants to help mitigate industrial CBM impacts.
- ✓ The lack of agency revenues for projects provided an opportunity for habitat biologists to monitor previous WGFD-funded projects and provide follow-up consultation with cooperating landowners. "Before and after" photos were taken of three riparian enhancement projects. These photos were used to develop posters that demonstrate how riparian habitats can benefit from short-term livestock exclusion. Figure 4 depicts monitoring for one of the riparian buffer projects.
- ✓ Fisheries management and aquatic habitat personnel met with representatives of the Public Land Users Coalition (PLUC) to identify potential improvement opportunities within the Sheridan County property containing the Kleenburn Ponds. Connecting the two ponds was selected as a preferred option for improvement efforts (Figure 5). Fisheries management and PLUC representatives are pursing Abandoned Mine Land funding to complete the improvement work.
- ✓ Many landowners are concerned about the effects of CBM developments on wildlife populations. In response, the Powder River Basin Resource Council (PRBRC) prepared a National Fish and Wildlife Foundation grant to hire a biologist to work with landowners affected by CBM development. They proposed the biologist work with landowners and industry representatives to mitigate adverse effects. Unfortunately, the grant was not funded. The Lake DeSmet Conservation District responded to landowners concerns by providing a workshop titled *Sharing Solutions to Successful Plantings in the Northern Great Plains.*

Figure 4. A before (above) and after (below) comparison of a CCRP riparian buffer project on Clear Creek, showing three years of improvement after livestock exclusion.

Figure 5. Design concept for the pond connection option being considered for Keenburn Ponds. Possible excavation areas are outlined in red.

Habitat Biologists assisted in planning the workshop and participated by attending sessions and preparing a display board that showed restoration success stories.

- ✓ The local Pheasants Forever chapter proposed hiring a biologist to work with private landowners. This position would focus on upland game bird habitat enhancement. They pledged one-half the salary if the WGFD or NRCS could produce the other half. Like the PRBRC, they feel there is a need for a dedicated biologist that can work with private landowners to take advantage of federal and local program dollars. The funds were turned down because agency personnel were reluctant to hire a temporary technician for a job that requires extensive training.
- ✓ A wildlife friendly CBM well cover design concept was developed for the Coal-Bed Methane Coalition coordinator. She found a company that is considering the production of the cover.
- ✓ A working group was formed to develop a watershed plan that addresses water quality impairments on segments of the Goose Creek watershed. The intent is to plan and subsequently implement voluntary best management practices that will remedy the impaired segments. The offer was extended to assist in developing stream restoration or riparian improvement strategies for the plan.
- ✓ Stream improvement and cost-share information was provided to the owner of a small parcel with Piney Creek frontage in Sheridan County. No opportunity for angler benefits was available.
- ✓ A tour was completed with two landowners near Dayton to assess the potential for wetland or fishpond developments on their small property. The landowners wanted to construct a publicly assessable reservoir. Limited potential for surface area and depth made the project nonviable as a sport fisheries project and marginal as a wetland project.

Fish Passage and Diversion Screening Investigations

Several fish passage related projects, which included the following, were investigated during the year:

- ✓ A meeting was held with the fisheries management supervisor, an engineering contractor, and a landowner on the South Fork of Crazy Woman Creek to discuss the potential to mitigate the loss of fish passage (stream habitat function) at two proposed in-channel irrigation reservoirs. Ideas were provided on how the project might accommodate fish passage.
- ✓ Assessments were completed relative to the feasibility of constructing a barrier in Muddy Creek below the diversion to Muddy Guard Reservoir #1. The goal would be to confine sucker-species below the inlet to the reservoir and prevent future colonization and proliferation that would reduce the sport fishery potential of the reservoir once it is rehabilitated. A structure that creates a 2-foot drop height in the water surface elevation or water current velocities greater than 11.25-feet per second will exclude white suckers with body lengths of 15-inches or smaller (Meixler and Bain 2003). The construction of a plunge pool barrier appeared feasible on segments of Muddy Creek on properties owned by two different landowners. A structure could function to exclude suckers during flows up to bankfull conditions. Higher, floodplain flows could provide a passage route for migrating suckers around the structure.
- ✓ Fisheries management, aquatic habitat and Wyoming Department of Transportation (WYDOT) personnel met to ascertain the intent of the fish passage barrier (Figure 6) at the Interstate-25 culvert on Clear Creek. A WYDOT representative indicated the structure was built to control the grade of the channel after the channel segment above the culverts was shortened and relocated to accommodate the southbound on-ramp for I-25. A letter was submitted to WYDOT requesting they initiate and oversee a redesign and channel rehabilitation project to eliminate the barrier, or bypass the barrier via a fish ladder.

Figure 6. The Interstate-25 grade control structure is a barrier to fish migrating to upper segments of Clear Creek.

- ✓ A tentative priority list of stream habitat fragmentation issues was compiled with input from the fisheries management supervisor and forwarded to the Aquatic Habitat Program Manager. Tentative priorities were identified as the Kendrick Diversion on Clear Creek, the Welsh diversion on the Tongue River, and the Interstate 25 culvert grade control barrier on Clear Creek.

Literature cited: *Meixler, M. and M. Bain. (2003). Habitat fragmentation mapping. Department of Natural Resources, Cornell University. Online:* http://www.dnr.cornell.edu/hydro2/greatlakes/habfrag.htm

Kendrick Dam Fish Passage and Screening Evaluation on Lower Clear Creek

An additional $15,000 of United States Fish and Wildlife Service (USFWS) Partners for Wildlife funding was secured for the fish passage and screening concept design project at Kendrick Dam. This matched the $15,000 allocated by the Commission via the Wildlife Trust Fund. An additional $30,000 was requested from the USFWS Fish Passage Program, to match secured funding, and another $20,000 was requested from the Wyoming Wildlife Heritage Foundation. In total, $80,000 has been requested for the concept design phase of the project, but only $30,000 was secured by years end. The Request for Proposals, which will examine two fish passage and two fish screening alternatives at Kendrick Dam (Figure 7), was mailed to prospective consultants in the first week of 2004.

Figure 7. Kendrick Dam, which occurs on lower Clear Creek, is a barrier to fish migrating up Clear Creek (Mark Hogan, USFWS photo).

Lake Desmet Conservation District WHIP Stream Project

A $10,000 WGFD Wildlife Trust Fund grant was secured to cost-share with the Lake DeSmet Conservation District on a Wildlife Habitat Incentive Program (WHIP) project involving stream rehabilitation practices on about 14-miles of stream habitat distributed across five reaches in northern Johnson County. The funding will go toward completing the hydrology and geomorphology assessments and restoration design components of the projects. During 2003, one of the original stream reaches was replaced by another – the Gordon diversion on Clear Creek. Assessment and design work was completed on the Gordon diversion reach by a local contractor. The remaining grant funding will be concentrated on the assessment and design efforts along the Clear Creek segment through Buffalo.

Ranch-Wide Management Plan Projects

One ranch-wide management plan was completed for a 700-acre ranch in Campbell and Crook Counties. Funding from the NRCS and USFWS Partners for Wildlife program was secured to implement the plan. Riparian areas on the property were fenced to promote better livestock grazing management. Pipelines and stock tanks were installed from an existing well to improve the distribution of water sources. Shrubs were planted to enhance wildlife habitat values. The overflow from an artesian well was piped to existing seasonal wetlands to increase the duration of wetland pools.

Powder River Watershed Survey

Assistance was provided to fisheries management supervisor to formulate a State Wildlife Grant proposal for fisheries and habitat inventory work on the Powder River and its major tributaries. The proposal was not approved for funding. Instead, a broader project for stream inventory in priority areas of eastern and central Wyoming was funded. A trial warm-water stream assessment (WSA) was completed by fisheries management, aquatic habitat, and Cooperative Fish and Wildlife Research Unit personnel during August

on a reach of the Powder River east of Kaycee. More intensive inventory and assessment efforts will be initiated by fisheries management and aquatic habitat personnel in 2004.

Sagebrush Ecosystem Guidelines

Inter-divisional efforts were initiated at the statewide level to reconcile the guidelines for sagebrush-grassland ecosystem management with the guidelines for sage grouse habitat management. Comments were compiled regarding watershed level concerns on several draft versions of the guidelines. A presentation was completed on considerations for watershed and aquatic resources management in sagebrush ecosystems at the Sagebrush Ecosystem workshop held in Rock Springs.

Sage Grouse Habitat Research and Habitat Monitoring Projects

The trend in the sage grouse population for the Sheridan Region suggests about a 10-year cycle with periodic highs and lows. Of concern, however, is that each subsequent peak in the population is usually lower than the previous one. This suggests a steadily declining sage grouse population. Much of this decline is likely due to habitat degradation from agriculture activities and coal mines. Currently, however, there's a new threat to remaining sage grouse habitats in northeastern Wyoming. Coal-bed methane (CBM) development (Figure 8) is continuing at an unprecedented scale and rate. The Bureau of Land Management's (BLM) proposed action includes drilling, completing, operating and reclaiming almost 39,400 new wells and constructing, operating, and reclaiming various ancillary facilities needed to support them. These developments will occur in a project area of almost 8,000,000 acres (mostly within the WGFD Sheridan Region). Drilling will continue for a minimum of ten years.

Figure 8. CBM facilities and associated habitat disturbance located northeast of Sheridan, WY.

The unprecedented scale and rate of this development sent local WGFD and BLM biologists scrambling for useful information. For the most part, they found little. It quickly became apparent that new research would be needed to determine how thousands of small industrial disturbances, hundreds of new roads and associated activities and new noise, air and water pollution would impact sage grouse. This research would also need to evaluate these changes within an already modified environment. Extensive sagebrush conversion from agricultural activities and surface coalmines are commonplace.

This monumental task would require large sums of money to conduct complex research. It was also needed to employ new technologies, such as space-borne sensors and geographic information systems (GIS), to measure and analyze landscapes and deal with voluminous databases.

To date, contributions from the U.S. Department of Energy (DOE), Bureau of Land Management offices in Wyoming and Montana, Montana Fish Wildlife and Parks, National Fish and Wildlife Foundation, a coalition of private oil and gas companies, Budweiser and USGS EROS Data Center have exceeded $500,000. The WGFD continues to work with these partners to initiate conservation planning for sage grouse in the Powder River Basin of SE Montana and NE Wyoming. The vision is to develop planning tools that provide partners with the information necessary to support the National Environmental Policy Act by providing information on sage grouse habitats and populations and how to mitigate CBM effects. This project tests actual CBM impacts and the sufficiency of current BLM protective measures enabling better management of sage grouse and their habitats.

Thanks to the above contributors, University of Montana researchers have expanded the current sage grouse nest study to quantify sage grouse habitat requirements during all seasons of the year. They also propose to link sage grouse habitat and population data with habitat inventories (using satellite sensor data) to create planning maps that prioritize landscapes for sage grouse conservation in the entire Powder River Basin. Linking bird-habitat relationships with spatial data will provide managers with the tools they need to plan for methane extraction while assuring effective environmental protection through research, development and technology transfer.

Specific WGFD activities included the following:

- ✓ Participated in meetings and conference calls with partners and University of Montana researchers relative to study designs, research goals and objectives, and project sites to initiate the above sage grouse research. Also provided GIS layers and information to formulate a research proposal.
- ✓ Toured research sites with University of Montana researchers, BLM, Jack Connelly (Idaho Fish and Game Department), USGS-EROS Data Center and others to discuss and critique the study design of the second PhD project. Both projects are designed to determine what effects CBM developments are having on sage grouse and their habitats.
- ✓ Worked with the BLM and a private consultant to prepare a proposal for tracking radio-collared sage grouse using satellite technologies (Figure 9).
- ✓ Prepared a Trust Fund grant proposal to request WGFD funding to match a National Fish and Wildlife Foundation contribution for the above research. Also researched funding opportunities from conservation groups in Wyoming.

Figure 9. Radio-collared sage grouse ready for release by University of Montana researchers (Brett Walker photo).

- ✓ Worked with a USGS EROS Data Center researcher to conduct temporal change detection at a finer scale and develop techniques for using Landsat winter scenes to improve sagebrush-mapping capabilities.
- ✓ Used techniques outlined in the paper *Use of Remote Sensing Methods in Modeling Sage Grouse Winter Habitat* and other scientific publications to develop a GIS model to map probable sage grouse winter ranges. Sage grouse observations from winter reconnaissance flights, the WGFD Wildlife Observation System and research relocation data will be used to assess the accuracy of the model.
- ✓ In addition, a GIS-based model allowed biologists to delineate and map suitable yearlong sage grouse habitats in the Sheridan Region. This expert-opinion model was based on the availability of sagebrush resources and texture analysis of different landscapes.
- ✓ Used Buffalo BLM funds to hire an image analyst to use Landsat satellite sensor data to map temporal changes in vegetation and water in the Wyoming portion of the Powder River Basin. The results were conveyed to BLM biologists and CBM regulators. These GIS-based maps delineate habitats where dramatic change has occurred over the last ten years. We can now start to identify many CBM associated surface disturbances, some fires, native rangeland conversions, coal mine advancements, new roads, etc. WGFD personnel will use the data to determine the rate of sagebrush conversion within select sage grouse complexes. This work will be accomplished this winter after additional data validation work has been accomplished.

Shutts Flat Instream Habitat Improvement Project on the South Tongue River

Riparian greenline, cross-section and woody plant regeneration transects were completed at Shutts Flat, which is the site of a late 1990s era stream improvement project completed by aquatic habitat and

construction personnel, to establish permanent riparian monitoring. Ecological status along the riparian greenline was rated as late successional (74%), bank stability was rated as high (7.23 of a possible 10), and mesic-dominated plant communities comprised 85 percent of the greenline community composition. Ecological status across riparian cross-section transects was rated as early successional (19%). Late successional communities comprised 33 percent of the cross-sectional community composition. Mesic–dominated communities comprised 44 percent of the cross-sectional community composition. The woody plant regeneration transects indicated seedlings were absent in the complex, but sapling or re-spouting plants were more abundant than mature and dead plants in the riparian complex. Herbivory of woody plants appeared intense.

The aquatic habitat biologist met with BNF personnel and the grazing permittee regarding the permittee's proposal to increase cattle grazing use at Shutts Flat. The proposal entailed using Shutts Flat as a relief value in addition to the normal trailing and late fall use. The relief value concept entails shifting problem cattle use at nearby cabins, campgrounds and along Highway 14 to Shutts Flat for one to two-day stays until riders were available to move the cattle further away. The permittee indicated the area was used as a relief valve on a "few" occasions during the summer and fall. Several tours were completed during August and September to assess the affects of the increased grazing pressure. Physical impacts to stream banks were noticeable, particularly at stream crossings. It was not apparent if physical bank impacts had increased over previous years of typical use. Observations indicated the area would likely meet the stubble height requirements for sedges. Most of the riparian bluegrass communities showed considerable use, as had been the case with the typical grazing regime during previous years.

Story Hatchery Ponderosa Pine Restoration and Fuel Break Creation

The USFS, State Forestry Division, Story Fire District and WGFD worked together to develop a plan for restoring over-stocked ponderosa pine forests while creating a firebreak on WGFD lands (Figure 10). State Forestry personnel created a Stewardship Plan for the Story hatchery property and adjacent lands. They also marked "cut" trees. These activities are designed to protect hatchery structures from wildfires and to reduce the risk of large-scale bug kills. Timber harvesting was initiated in the winter of 2003.

Figure 10. The shaded fuel break work on the Story Hatchery property.

Upper Little Bighorn River Watershed Survey

Watershed surveys were completed on segments of Willow, Duncum and Wagon Box creeks using the level-1 Wyoming Habitat Assessment Methodology. These stream segments were also considered for beaver transplants. Only Duncum Creek appeared to possess any noteworthy riparian floodplain habitat with some potential to support beaver.

Recording thermometers were used to assess mean daily water temperatures in segments of the upper Little Bighorn River, Gold Creek, Little Falls Creek, Dayton Meadows on the Little Bighorn River, Half Ounce Creek, and Dayton Gulch Creek. Mean daily temperatures were averaged to derive mean water temperatures for July 2003. These stream segments are being considered for brook trout removal to facilitate Yellowstone cutthroat trout introduction or restoration. Harig and Fausch (2000) found narrow ($\leq$ 6.6 ft bankfull width of pools), deep pool-limited (# of pools with residual depths $\geq$ 1 ft) streams with mean July water temperatures below 51.8^{o}F were less likely to support translocated greenback cutthroat trout populations. However, increasing stream width and abundance of deep pools alleviated the adverse

effects of cold summer temperatures on recruitment until extreme cold began to limit fry survival (mean July temperatures < about 45 to 46 ^{o}F).

Temperature assessments suggested cold temperatures could limit Yellowstone cutthroat trout recruitment in most stream segments of the upper Little Bighorn River. None of the reaches assessed maintained an average July temperature exceeding the proposed 51.8^{o}F threshold (Table 1), though the segment of the upper Little Bighorn River through Dayton Meadows was close.

Table 1. Mean monthly, and minimum and maximum daily water temperatures for six segments of the upper Little Bighorn River watershed in July 2003.

Stream	Elevation	Mean Temperature	Maximum Temperature	Minimum Temperature
	(ft)	(^{o}F)	(^{o}F)	(^{o}F)
LBR (above Gold Creek)	8,800	45.1	55.9	37.6
Gold Creek	8,840	50.7	57.7	44.1
Little Falls Creek	8,720	48.0	55.4	43.0
Half Ounce Creek	8,400	47.7	55.6	42.6
Dayton Gulch Creek	8,560	42.4	51.8	38.1
LBR (Gold Creek to Dayton Gulch Creek)	8,300	51.3	60.3	44.1

Stream-scale channel assessments were completed on segments of the Little Bighorn River watershed as per Harig and Faush (2000) protocol. Residual pool depth and bankfull stream width of pools were recorded within each stream segment. These data along with probability estimates of population status following the stream-scale habitat model from Harig and Fausch (2000) are presented in Table 2.

The stream scale assessments indicated the greatest potential to establish and maintain a Yellowstone cutthroat trout population existed in the Little Bighorn River segment between Dayton Gulch and Gold creeks (P=0.99), and secondly, within Gold Creek (P=0.36), though the potential of the latter segment would be characterized as marginal. The remaining segments displayed limited to virtually no potential (P=0.01-0.04) to support cutthroat trout populations (Table 2).

Table 2. Mean July 2003 water temperature, mean bankfull width of pools, number of deep pools, and probability estimates of cutthroat trout population status for six segments of the upper Little Bighorn River watershed.

Stream	Mean July Temperature	Mean Bankfull Width of Pools	Number of Deep Pools	Probability High Population	Probability Low Population	Probability Population Absent
	(^{o}F)	(ft)	(#)	(P)	(P)	(P)
LBR (above Gold Creek)	45.1	9.2	8	0.03	0.30	0.67
Gold Creek	50.7	9.2	10	0.36	0.52	0.11
Little Falls Creek	48.0	6.2	7	0.04	0.32	0.64
Half Ounce Creek	47.7	6.2	5	0.03	0.28	0.69
Dayton Gulch Creek	42.4	7.9	12	0.01	0.07	0.93
LBR (Gold Cr. to Dayton Gulch Cr.)	51.3	19.4	62	0.99	0.01	0.00

Literature cited: *Harig, A.L. and K. D. Fausch. 2000. Factors influencing success of cutthroat trout translocations. Final Report to Colorado Division of Wildlife. Montrose, Colorado.*

West Weston Pond Habitat Grant Project

Coordination with Bureau of Land Management, Buffalo Field Office personnel indicated the contract to outfit the supply well and complete the pipeline to the new reservoir, which was completed in 2002 via a WGFD Wildlife Trust Fund grant, was let during late 2003. The work will likely be completed during 2004, which will complete the grant project.

WILDLIFE HABITAT MANAGEMENT AREAS

Habitat and Access Maintenance and Enhancements on Wildlife and Public Access Areas

Important goals for all habitat personnel are to increase or maintain wildlife habitat and associated recreation on Commission lands. The principal objective is to provide for the long-term needs of wildlife by restoring or maintaining ecosystem functions and processes, while providing reasonable public access, were feasible, to Commission lands. Wildlife Habitat Management Areas (WHMAs) in the Sheridan Region include the Kerns, Amsden Creek, Bud Love and Ed O. Taylor. The Sand Creek WHMA occurs in the Sheridan Aquatic Region. Specific projects and activities accomplished in 2003 included:

- ✓ Efforts to replace old or inferior stock fence and elk fence posts on the WHMAs were continued. Three hundred elk fence posts were replaced on the Taylor Flat segment of the Kerns WHMA by a local contractor (Figure 11).
- ✓ Conservation Engineering Branch personnel were enlisted to survey, complete rehabilitation designs for the reservoirs and irrigation system, and clean up the water rights on the Bud Love WHMA.
- ✓ Cattle grazing of the Sand Creek WHMA were managed similar to past years. Three hundred twenty four pairs, including some bulls were turned in on May 15 and most were removed on May 23. The stragglers, though not quantified, remained until May 27. This resulted in about 88 animal unit months (AUMs) by the main herd and perhaps 10 additional AUMs by stragglers. Riparian habitats and stream bank stability appeared good following completion of the grazing.

Figure 11. The elk fence at the Kerns WHMA during post replacement by a local contractor.

- ✓ A summary of the history of livestock grazing and other vegetation management activities at the Sand Creek WHMA was prepared for consideration in assessing the potential impacts of a proposal to graze cattle at the Ranch-A property. The Ranch A property, which was formerly a Department fish hatchery, is administered by the Ranch-A Foundation and State Land Board.
- ✓ A new farming lease was awarded on the Amsden Creek WHMA.
- ✓ Burn blocks were examined prior to winter and modifications were made prior to the initiating proposed spring burning activities on the Ed O. Taylor, Bud Love and Kerns WHMAs. Burn plans and smoke permits were submitted for these WHMAs.
- ✓ Comments were provided on the Department of Environmental Quality's proposed smoke regulation model. These regulations will affect most prescribe burning activities on WHMAs.
- ✓ Sheridan College students were used to prepare GIS map layers for the Amsden Creek and Ed O. Taylor WHMAs. Map layers for the Kerns and Bud Love WHMAs have already been completed.
- ✓ BNF personnel and livestock grazing permittees were involved in efforts to design a grazing program that would incorporate the USFS Elk Pasture portion of the Amsden Creek WHMA. The intent was to create a reserve area that would allow rest from livestock grazing to facilitate prescribe burning.
- ✓ Acreages were calculated for the area involved in a give-and-take fence line on the Ed O. Taylor WHMA. The information was presented to the adjacent landowner to rectify a perceived problem with the grazing exchange.
- ✓ A tour of the BLM's Middle Fork Habitat Management Plan area was attended with agency personnel and the livestock grazing permittee. Grazing impacts were reviewed and solutions discussed.
- ✓ Noxious plants and re-sprouting shrubs were controlled along the fence lines and fire lines at WHMA boundary fences. The clearing of shrubs will relax concerns about burning as well as improve fence inspections and maintenance.
- ✓ A spraying contractor, in consultation with the Crook County Weed and Pest District, controlled noxious vegetation on the Sand Creek WHMA.

Aquatic and Terrestrial Habitat Priorities

Aquatic (Figure 12) and terrestrial (Figure 13) habitat priorities were finalized for the region pursuant to guidance established by the Strategic Habitat Plan implementation team.

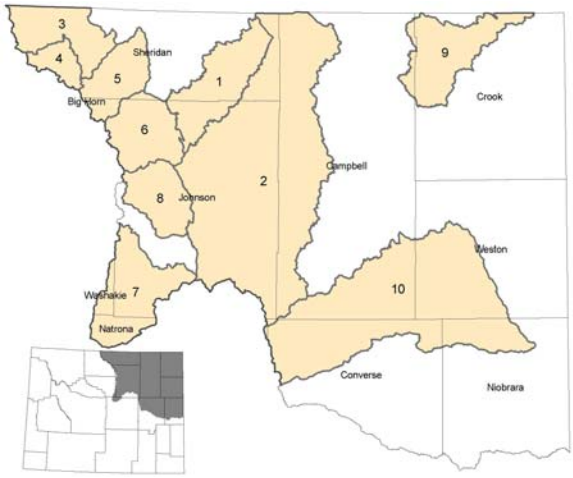


Figure 12. Locations, depicted by shading, and ranks of aquatic habitat priority areas within the Sheridan Aquatic Region.

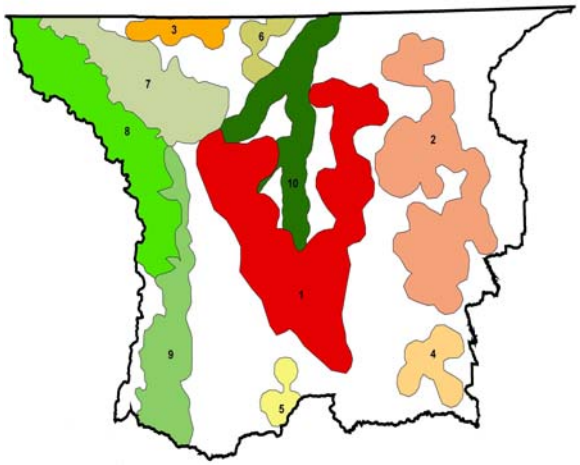


Figure 13. Locations, depicted by colored highlights, and ranks of terrestrial habitat priority areas within the Sheridan Terrestrial Region.

Strategic Habitat Plan Implementation Committee

Assistance was provided to refine guidelines for the mapping statewide habitat priorities and to explore options to create forage reserves, which could be used in the future to facilitate passive restoration efforts.

MISCELLANEOUS

Workshops and In-service Training

- ✓ The Aquatic Habitat Biologist attended the Seven Habits of Highly Effective People course.
- ✓ The Terrestrial Habitat Biologist attended a USFS session on the use of Landsat data to map plant communities in western Wyoming.
- ✓ Aquatic Habitat and Construction personnel attended a water law seminar.
- ✓ Aquatic and Terrestrial habitat personnel attended a WyoView program presentation.
- ✓ The Aquatic Habitat Biologist attended several symposia at the Society for Rangeland Management meeting.
- ✓ Terrestrial and Aquatic habitat personnel attended the Sagebrush Ecosystem workshop held in Rock Springs.
- ✓ The Aquatic Habitat Biologist attended an ArcView GIS training course.
- ✓ Terrestrial and Aquatic habitat personnel attended the Northern Great Plains Ecoregion Vegetation Management Science Summit held in Sheridan.
- ✓ Aquatic and Terrestrial habitat personnel attended a Riparian Greenline Monitoring workshop taught by Dr. Alma Winward.
- ✓ The Aquatic Habitat Biologist attended a warm water stream assessment protocol workshop.

Assistance with other Department Endeavors

- ✓ Terrestrial and Aquatic habitat, and Construction personnel assisted with CWD surveillance at processing plants and check stations located throughout the region.
- ✓ The Aquatic Habitat Biologist assisted with the North Fork of Clear Creek tag and recapture study above and below the baffled culvert under Highway 16.

- ✓ The Terrestrial Habitat Biologist assisted with big game seasonal distribution map revisions.
- ✓ The Terrestrial Habitat Biologist assisted with the Western Association of Fish and Wildlife Agencies mule deer habitat mapping and risk analysis project.
- ✓ The Terrestrial Habitat Biologist assisted in the development of a GIS database for the sage grouse conservation work-plan.

Information and Education Efforts

- ✓ The Aquatic Habitat Biologist helped staff a display booth and answered questions at the Farm Bureau Convention held in Sheridan.
- ✓ The Terrestrial Habitat Biologist completed lectures to two Sheridan College classes, which dealt with techniques used to conduct cumulative effects analysis concerning changes in landscapes and their effects on wildlife habitats.
- ✓ The Terrestrial Habitat Biologist prepared a Wyoming Wildlife Magazine and Wyoming Wildlife News article concerning the effects of motorized roads on wildlife.
- ✓ The Terrestrial Habitat Biologist provided a display showing the effects of motorized roads on elk at the big game season setting meeting in Sheridan.
- ✓ The Terrestrial Habitat Biologist prepared a news release concerning the effects of burning fields and field edges on upland game birds.
- ✓ The Terrestrial Habitat Biologist provided a presentation at a The Nature Conservancy conference concerning possible effects of CBM development on wildlife resources.
- ✓ The Terrestrial Habitat Biologist prepared posters of successful WGFD extension service projects that were shown at various functions in the state.

LANDS ADMINISTRATION BRANCH

Implementation of the Department's Strategic Habitat Plan (SHP) included the staffing of a position in the Lands Administration Branch. Directed by goals and objectives of the SHP, the focus of the lands position is to acquire property rights by application of various strategies including fee title purchases, conservation easements, grass banks, leases and other agreements. Also required are monitoring efforts to protect department property rights interests, coordination with department personnel, land trust organizations, and with other agencies and entities.

Projects initiated and completed required constant cooperation and coordination with field personnel from all divisions.

PROJECTS

Thoman Ranch Lease Phase I

The Thoman lease was the first property rights project initiated and completed through the SHP. Located in Lincoln County along Twin Creek near Nugget, the Thoman Ranch supports multiple species crucial winter range. It also provides important migration corridors for mule deer and elk, and offers quality non-intrusive winter wildlife viewing opportunities.

Thoman Ranch Lease – Twin Creek.

Private lands were leased on the ranch for a ten-year term with an option for another ten years. The Department also obtained a first option to purchase the property should the Thomans decide to sell during the term of the lease.

Significant winter elk and mule deer use of the lease continues to be documented by regional personnel. A second part of the ranch may be leased in the near future, as issues relating to BLM leasing are resolved.

- ✓ SHP Goal 1, Objective 11, Strategy 1 authorized hiring another property rights specialist.
- ✓ Property Rights position in the Lands Branch filled May 2002.
- ✓ The WGFD owns and manages 183,390 acres on WHMAs, fish hatcheries, bird farms, feed grounds, and administrative complexes.
- ✓ The WGFD pays property taxes on all its fee title lands.
- ✓ Federal leased, agreement, or coordinated lands = 181,560 acres.
- ✓ WHMA stream miles = 103.
- ✓ Stream easement miles = 121.
- ✓ Road easement miles = 155.

Thoman Ranch Lease – Winter elk use

Red Canyon Exchange

Objectives and strategies of Goal 3 of the SHP provided guidance for the proposal to exchange various property rights on the Red Canyon WHMA. An exchange of lands leased from the state and acquisition of permanent public access will improve WHMA management and insure continued recreational activities on the WHMA and on adjacent public lands. A permanent access easement was also obtained.

Medicine Lodge Disposal

In the interest of improving management options, a small portion of the Medicine Lodge WHMA has been targeted for disposal. Water rights and irrigation on the property complicate management, and it is difficult to issue and monitor contracts that provide any wildlife benefits.

After careful consideration of all available options, including various exchanges, Cody regional personnel proposed a competitive bid sale of approximately 100 acres of irrigated hayland and 74 acres of adjacent uplands. A conservation easement and public access will be retained on the site.

- ✓ Chapter 57 of WGFD regulations direct fee title acquisitions.
- ✓ Commission policy guides acquisitions of easements, leases, agreements, and other less than fee title transactions.
- ✓ All property rights considered for acquisition must be submitted to the Habitat and Access Evaluation Process (HAEP).
- ✓ All property rights considered for acquisition must be approved by the appropriate region, by staff, and finally by the Commission.
- ✓ Contact the Lands Administration Branch for any property rights questions or advice.

Jelm Encroachment

Long standing encroachment problems associated with the Commission owned fee title lands on the Jelm unit are being addressed. Special Use Permits granted to several area landowners approximately 10 years ago have expired and most encroachments were removed. Encroachments from two adjacent properties remain. One landowner was allowed to renew the special use permit in exchange for access across private lands. Another landowner has refused to cooperate and the issue has been referred to the State Attorney General's Office.

Funding Sources Database

The need for a central source of information regarding potential funding sources from the federal government and from private sources has long been discussed. A database to provide funding source information is in various stages of construction. Database creation, location and summarization of funding information has proven to be quite daunting and extremely time consuming. A draft version of the database will be sent to aquatic and terrestrial habitat biologists for input and comment.

Department – Federal Agreements Database

The Department's relationships with federal agencies on WHMA's was recently examined. That exercise led to the realization the department needs an easily accessible and user-friendly source of information related to the agreements we have with the federal government. A database is being developed.

Other Projects

Projects either ongoing, cancelled, or on hold include: Wind River/Wiles land donation, Ocean lake/Maxon access, Sybille/Christnick exchange, Chain lakes grazing, Sheridan Bird Farm/Qwest easement, Dorner lease. Numerous meetings with department personnel have been held. Met with representatives of the state's private land trusts, and the Land Trust Alliance national conference was attended.